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Photo by] [Thwaites

Graded Friesland Cow, the property of Mr. Macarthur, Salisbury.
1st and Champion at the Agricultural Show, Salisbury, 1908.

THE RHODESIAN

AGRICULTURAL JOURNAL

Edited by the Director of Agriculture

Assisted by the Staff of the Agricultural Department.

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Editorial.

THE EXPORTATION OF MAIZE.—A milestone on the path of progress has been reached, and we find Rhodesia entering for the first time, the field of the world's market for maize. Sooner than was generally anticipated, the Farmers' Co-Operative Society of Salisbury has decided to test the European market by shipping ten thousand bags of maize, through the medium of the B. & M. & R. Railways under the scheme devised last year but not hitherto taken advantage of whereby the Railway Company undertakes the despatch to London and sale there of farmers' maize at a uniform tariff charge of half-a-crown a bag. The maize before export has to be examined and graded, and this entire consignment will come under the one grade, fair average quality, and under the designation "Rhodesia Flat White." The progress of this venture will be followed with the liveliest interest, and we wish it all possible success.

IMPORTATION OF CATTLE.—The introduction of cattle is subject to sundry very necessary stipulations and restrictions which, however, are burdensome to would be importers, whether buyers, dealers or settlers. The terms of the breeders certificate, known to many as Annexure "B," intended to prevent the remotest possibility of the introduction of lung sickness, need specially careful atten-

tion. To this end and to expediate the granting of permits of entry, provision was made on the Estimates last session for the appointment of an Examiner of Livestock, whose special duty it shall be to ascertain that these regulations are rigidly enforced and that the certificates are strictly in accordance with fact. At the same time he will be empowered to grant permits and to sign railway rebate certificates, thereby saving much time and materially facilitating the despatch of purchased livestock.

The procedure hitherto followed remains in force, but buyers may obtain the necessary certificrtes either as heretofore from the Chief Veterinary Surgeon or from the Examiner of Stock, P.O. Box 502, Port Elizabeth. For this responsible post the Government have been fortunate in securing Mr. James Woodin, the Secretary of the Port Elizabeth Agricultural Society, a gentleman of wide South African experience and in close touch for years with the foremost breeders in Cape Colony and conversant with the circumstances of the different breeding areas. Mr. Woodin will also act as purchaser of livestock for farmers buying cattle under the scheme detailed in the Agricultural Journal for August, whereby the Government procures breeding stock for farmers on an instalment system and meets the risk of the tuberculin test and journey. An encouraging commencement has already been made with this matter and applications for cattle are being now received.

MOVEMENT OF STOCK, MASHONALAND.—Amongst the Government Notices published at the end of this Journal, special attention may be drawn to that headed Movement of Stock, Mashonaland. Difficulty is occasionally experienced in following the intricacies of the regulations. Circumstances arise necessitating from time to time the alteration, modification, and abolition of regulations issued in previous Notices, or of portions of these, and such changes apply at times to the whole area and at times to certain portions of it only. Confusion naturally creeps in, and occasionally hardships arise. It therefore becomes necessary periodically to revise and consolidate under one Government Notice the existing regulations. This has in this instance been done; much that is obsolete has been omitted and sundry modifications

introduced tending on the one hand to facilitate movement where no danger exists, on the other to render control more direct and effective. In this way the grouping of districts in which the movement of working cattle may with some degree of freedom be allowed is extended, particularly with a view of giving access to the railways. The power to insist on the cleansing from ticks by spraying or dipping of cattle moving about the country is extended so as to include all classes of stock, whether for breeding, mining, dairying, grazing or slaughter, as well as transport animals, to which this useful provision previously only applied. Provision is also made for preventing the movement of tick-infested animals until they have been dipped or sprayed. To this end authority is conferred on cattle inspectors or other officials to stop any cattle moving under permit if found to be infested with ticks. This precaution is calculated to prevent spread of infection of any tick borne disease, and should tend to prevent the spread of ticks generally. Stockowners may be recommended to make themselves acquainted with these new regulations.

THE QUALITY OF RHODESIAN MAIZE.—This subject will be found fully treated on another page. The merits of our mealies require no demonstration; it is the defects that want consideration. Fortunately the imperfections referred to are due to no natural or irremediable causes, telluric or climatic, nor are they due to fault of variety nor to disease.

The drawbacks are entirely within the power of the farmer to rectify and at a comparatively small outlay of money. The quality of good maize is reduced by the presence even of a small proportion of inferior grains, while the presence within the bag of fragments of foreign material, cob, husk, dust, earth, stones and so on, might readily be obviated. Hitherto, perhaps, there has been no incentive to take pains in this direction as buyers did not distinguish between clean and dirty mealies, but now with a more organised trade and in view of possible export, it is incumbent on those who desire to realise good prices, to prepare their produce for market in a proper manner. Especially is it desirable that the first consignments from Southern Rhodesia to Europe should

create a good impression, as the reputation of our maize will be very much made or marred by the earlier shipments.

For our conditions probably the most suitable machine is the hand or horse-power winnower, cheap, substantial, portable, and sufficiently simple in mechanism to put in the hands of the native labourer. In the first instance only a certain proportion of the crop is likely to be treated, and this clean graded grain it is which will be available for export or to meet any discriminating demand which is very likely to develop locally.

It will be noticed that as far as possible the familiar name of "mealies" is dropped in favour of the more correct term, maize, a word equally comprehensible and more favoured in the commercial world, although no doubt the colloquial term will remain in general use as does "corn" for the same plant elsewhere.

MEALIE GROWING.—Attention is called to an article by Mr. Mundy on the cost of growing mealies. It is commonly argued that as the cost of production is, say, 4 -, and the price 12/6, the profit represents over 200 per centum, with which surely the most avaricious may be satisfied. This is misleading reasoning. If a farmer could indefinitely increase his production and whenever occasion arose could go into into the market for further capital and be reconstructed like a joint stock company, there might be something in it. But there is a limit both to his capital and his powers of supervision, also to the fertile land on his farm, and it is a small minority who produce much over a thousand bags. Even that represents an income of but £625 per annum, and as this is at present the one great source of income of most farmers, it does not seem an excessive reward for their skill, exertions, risks and initial outlay.

UNDERGROUND WATER.—Mr. H. M. Oakley has furnished the Department with a report of exceptional interest and importance on the prospects of water being found by boring or well-sinking in different parts of the territory. Apart from the valuable advice offered to individuals as to their

particular requirements, the opinion is expressed as the outcome of extensive journeys and skilled observation, that exceptionally favourable subterranean hydrographic conditions exist throughout our sedementary formations, while even in the granite itself there are frequently good grounds to anticipate finding water. This report will be read with widespread interest, and the recommendations made may be assured of the fullest and sympathetic consideration of the Government.

CO-OPERATIVE EXPERIMENTS.—The value of agricultural experimentation is vastly increased if the number of trials can be multiplied so as to furnish during one and the same season a series of results from all parts of the country whereby the potential value or unsuitability of the crops tried may with some certainty be ascertained.

It is the aim of co-operative experiments to obtain as rapidly and certainly as possible some idea of the possibility of growing crops which there is reason to believe are, for one reason or another, worth cultivating on a large scale and likely to succeed. To this end parcels of seed will be distributed to farmers applying for the same, and it is thereby hoped to collect much valuable information during the course of the coming season. Details of the scheme will be found in our Departmental Notices.

PASPALUM DILITATUM: PLANTS FOR SALE.—This grass, the botanical name of which appears to have passed into ordinary use, has already by repeated experiment demonstrated its utility in Rhodesia, especially as a winter growing grass and in moist but well-drained localities. Paddocks of paspalum are likely to prove an invaluable help to the stock farmers, if only to provide a little green food, during the scarce time, for young cattle, milch cows, calves, and so on. As a rule paspalum is somewhat difficult to rear from seed, and farmers will do well to establish nurseries of it which can be looked after and, if necessary, manured or irrigated. Slips for planting out may be obtained at the price of 5/- per 1,000 free on rail Salisbury, but not exceeding 20,000 to any one applicant, cash to accompany orders, which will be

dealt with in order as received as long as the supplies admit. Applications should be addressed to the Agriculturist, Department of Agriculture, Salisbury.

FOREST TREES FOR SALE.—Attention is called to a Departmental Notice giving a list of the trees at present available for sale at the uniform price of one penny apiece. The planting season is now approaching and farmers occupying land under a permit of occupation may be reminded of the abatement of purchase price allowed on account of established plantations. The desirability on any farm or having a timber lot, shelter belt or groups of ornamental trees is too patent to require elaboration here.

The supply of trees is somewhat limited so that early application is advisable.

WORMS IN SHEEP.—This subject, of especial interest to the farmers of Melsetter, but of importance to many other districts where, by degrees, sheep are being experimentally introduced, is dealt with in an article by Mr. Jarvis, G.V.S., of Umtali. The losses in the past have been considerable, and are the more regrettable since the trouble might be controlled or prevented if only the proper treatment, by no means beyond the powers of the average farmer, were actively adopted and systematically continued. It is hoped the advice now given will do something to mitigate the evil and lead to its future avoidance.

AGRICULTURAL MOTORS.—In view of the occasional enquiries that are made as to the prospects and possibilities of utilising agricultural motors in Rhodesia, it is interesting to learn that the Royal Agricultural Society of England proposes to hold extensive and elaborate trials of this class of machinery at their annual Show to be held at Liverpool next summer.

So far attempts to use mechanical traction for farm purposes here have proved conspicuous and costly failures, but it cannot but be recognised that if machinery could be devised

to do ploughing and harrowing, hauling on roads and stationary engine work more cheaply and efficiently than by ox or manual labour and at the same time be so simple in management, control, cleaning and repair that a paid engineer does not become necessary, there would no doubt be an opening for such a prodigy in Rhodesia, more especially in the area, fortunately limited, where tsetse fly occurs or where movement of cattle is still restricted.

The motor has to compete in Rhodesia against the self-supporting ox, with readily replaceable wearing parts in the form of skeys and reims, with grass for fuel and a driver drawing per mensem the wage paid in one day to a mechanic. Still, the time may come when by improved construction and cheap fuel the ox can be relegated to its more congenial task of beef production, and such trials as are contemplated will be watched with interest even from this remote distance. We therefore append extracts of the regulations governing the proposed trials.

"For the purpose of these trials, an 'agricultural motor' may be described as any form of motor using either steam, oil, petrol, or electricity, as its motive power, which

(a) Shall be capable of hauling direct in work a plough, cultivator, harvester, or other agricultural implement.

(b) Shall be capable of driving such agricultural machines as a thrashing machine, chaff cutter, grist mill, etc.

(c) Shall be capable of hauling a load along a road and on the land.

The machines shall be tested for efficiency in carrying out all three classes of work.

The trials shall consist of ploughing with a three-furrow plough an area of six acres, one part of which shall be ploughed shallow and the other part deep at the discretion of the judges.

The fuel, water, and other supplies consumed throughout the trial will be carefully noted and compared with the weight of earth removed.

The fuel, whether solid or liquid, will be provided by the Society. The coal will be Welsh steam coal of uniform quality, and the petroleum or other liquid of one of the recognised brands.

Each competitor to state how many men will be required to attend to the machine.

The following are some of the points to which special attention will be directed :—

(a) Weight of machine.
(b) Weight per inch width of wheel.
(c) Mechanical design and construction.
(d) Adaptability to various kinds of work.
(e) Ease of handling.
(f) Safety of handling.
(g) Ease of turning and space required for same.
(h) Facility for attachment.
(i) Attendance necessary.
(j) Consumption of fuel, water, and other supplies per unit of work done.
(k) Price."

THE RHODESIAN AGRICULTURAL JOURNAL.—We present the Journal in a new guise and would call attention to the fact that it is now printed in Rhodesia. We take this opportunity of reminding subscribers that with this issue a new volume begins and would request them to bring the Journal to the notice of their friends as it is desired that every farmer in the country shall have a copy. Contributions on topics of interest to the farming community will be welcomed.

Government Aid in Fencing.

LOANS FOR FARMERS.

By THE DIRECTOR OF AGRICULTURE.

As a general statement it has long been recognised that great benefit would accrue to the farming community, both individually and collectively, if the country could be enclosed by a meshwork of fences traversing it in all directions, particularly in those areas most densely occupied by stock.

Resolutions and recommendations to this end have from time to time been passed by public bodies and the desirability of fencing has become an accepted and recognised fact. But in the past there have been two drawbacks to the systematic erection of fences in Rhodesia, each in itself sufficient to prevent the realisation of this pious hope. All fences on boundaries necessarily affect two parties and until the pressure of the law could be brought to bear there has not unnaturally been some disinclination on the part of neighbours to unite for such purposes. The application of the provisions or the Fencing Ordinance, No. 18 of 1904, to the Bubi District was the first attempt to overcome this difficulty, an example which is being followed in four other districrs at the time of writing, a clear proof of the active desire of the farmers to secure the benefits of fencing. A certain amount of opposition to this laudable desire is being met with on the part of owners of unoccupied land, which may unfortunately prevent the law from being applied, in spite of the general desire of the resident farmers. The other hindrance to the erection of fencing has been the very material one of lack of funds. A struggling farmer, especially one recently established, requires to invest as much as may be of his capital in an immediately productive form—for instance, in livestock—in place of in a manner contributing less directly to his momentary income, however economical, useful or otherwise desirable it may be. To meet this difficulty in other countries it has been found feasible to assist farmers financially and various different methods have been devised and are in force, suited more or less to the particular requirements of the country to which it is applied.

The proposal for Government to grant loans for fencing to farmers in Southern Rhodesia is by no means a new one and

the matter was brought up in different forms on three occasions in the last session of the Legislative Council. Though no provision for such a scheme was placed on the Estimates, the Government, through the Treasurer, intimated that if circumstances permitted an effort would be made to provide means for this purpose and the assurance was given on behalf of the elected members that any such steps would receive their entire approval and concurrence. It has now happily been found possible to realise these hopes and a scheme has been put into operation whereby, subject to certain necessary conditions and stipulations, sums up to a limit of £150 may be advanced to farmers for the purchase of fencing materials. It will be observed that, the loans being strictly on the £ for £ principle, this will enable a farmer, in any area in which the Fencing Ordinance is in operation to erect, jointly with his neighbours, a fence round his farm, the materials of which costs £600, of which he is liable for only the half, of which again the half, that is £150, is repayable by instalments on very easy terms. On the other hand if it be preferred and a good case therefore made to the Board the loans are equally applicable for the construction of internal fencing, subdivision of the farm, paddocks or roadside fencing.

Whilst a rigid standard rule would be out of the question and the adoption of any particular pattern, where there are so many good makes, would be invidious, a minimum must be fixed else there would be a likelihood of the facilities offered by Government being abused. The lines of such requirements are indicated but slavish adherence to this either as a model or standard is not intended and the grant of the loan is ultimately subject to the report of an inspector who shall satisfy himself first that the material claimed has actually been used upon the fence and further that the fence is properly erected and adequate for the object in view. The public money is not to be employed without the strictest supervision.

Bulb tee standards are in most general use but there would be no objection raised to many of the other patterns such as "Lochrin," etc., provided they were of sufficient strength, nor to the use of old rails, boiler tubes, stone pillars—as in the Orange River Colony—nor of hard wood under certain circumstances where the danger of fire and ants is small or

transport more than usually difficult. Not less than four wires should be used, five by preference, and the height of the fence should be in no case less than 48 inches, preferably 51 to 52 inches. The use of barbed or plain wire is at the discretion of the farmer, and will depend upon the object in view, roads, etc. There can be little doubt that barbed wire is the more effective fence, particularly where big game is met with, but is to be avoided when ostriches are to be enclosed. The guages in general use are No. 8 plain black annealed wire for fencing, or No. 10 for binding purposes, while barb wire with four points every six inches is usual, but these need not be invariably adhered to. A great variety of droppers are obtainable. If wire droppers, *e.g.* "Cyclone," or wire lacing is employed they must naturally be closer than if "H," "D" or other rigid steel droppers are employed. The object of droppers, it must be remembered, is to keep the wires parallel and prevent men or animals from squeezing through, thus giving strength to the fence; they are not intended for supports. Straining posts need not be of any special pattern provided they are sufficiently strong, and lengths of rail or other old iron is particularly suitable for such purposes. It is the fixing of the straining posts that is the important factor, for the whole line of fence depends upon these being firm and immovable. The same applies to corner posts. No particular class of make is favoured, but in this connection the admitted superiority of metal, wire and galvanising of British made fencing over foreign goods is generally admitted as well as its durability, although the price is apt to be somewhat higher and the foreign article is frequently more readily obtainable. The cost of gates may fairly be included as part and parcel of the fence.

Under this scheme it is not proposed to supply the materials to farmers, as is the practise in the Transvaal and elsewhere, but to allow the farmers to procure it through the ordinary trade channels, subject only to the necessary stipulation that the actual prices to be paid and qualities of material to be supplied must be furnished to the Board for its approval prior to any loan being granted. The necessity for this is obvious, and loans will of course not be provided where prices are exhorbitant nor until the Board is satisfied that a proper fence is erected.

The following are the terms on which the Government is prepared to advance funds to any owner of a farm beneficially occupied by a white person : -

1. Half the cost of the material at nearest station or siding will be advanced, in no case exceeding the sum of £150.
2. Payment shall be made in ten equal annual instalments, or less if the applicant desire, together with interest at 5% per annum, payable in July, but no repayment will be called for within one year of granting the loan.
3. The applicant will be required to pass a first mortgage bond over his farm as security for the loan, or to furnish a personal surety to the satisfaction of the Board.
4. The loan will be made on completion of the fence and subject to inspection by the representative of the Company. The fence may be erected to any pattern approved by the Board, but for guidance the following minimum requirements will normally be insisted upon : -

 Straining posts not further than 440 yards apart; standards not further than 60 feet apart; droppers or lacing not further than four yards apart. If no droppers are used, standards should not be more than 20 feet apart. If wooden strainers standards or droppers are proposed to be used, the kind is to be specified.
5. Applications stating the situation and mileage and furnishing specifications of fence proposed to be erected and accompanied by firm and detailed quotations for the material required and cost at nearest station, must be addressed in the first instance to the Director of Agriculture, Salisbury. Applicants should state whether internal or boundary fences are to be erected.
6. Preference will be given to farmers in areas which have adopted Part I. of the Fencing Ordinance, 1904.
7. Farmers are invited to submit applications for the consideration of the Fencing Board addressed to the Director of Agriculture, Salisbury.

Wells and Boreholes in Rhodesia.

The following report has been received from Mr. H. M. Oakley on the prospects of subterranean water supplies, and is published here on account of the interesting light it throws on the subject.

13th September, 1909.

To the Director of Agriculture,
Salisbury.

Sir,—In accordance with the arrangements entered into with your Department that I should visit Southern Rhodesia for the purpose of advising farmers as to the development of underground water supplies, I have the honour to state that I arrived at Plumtree on the 30th April last, and at once commenced a tour of inspection of the several farms whose owners had made application for my services in response to your Departmental Notice dated 2nd March, 1909.

I may at once say that from the investigations I have made I am of opinion that the prospects of obtaining underground waters by boring or sinking are on the whole exceptionally favourable.

Up to the present 92 farms have been visited in the following Districts, viz.:—Bulalema, Bulawayo, Gwelo, Hartley, Salisbury, Mazoe, Lomagundi and Victoria.

Although in the case of the farms enumerated sites for boring have been recommended or advice given as to the utilization and conservation of surface water supplies, it has occurred to me that a few hints as to the selection of sites for boring or sinking with a view to tapping subterranean water where such exist might be of general utility.

The principle geological formations to which I think I need refer are :—

1. Granite.
2. Schists.
3. Sandstones.

As regards granite, the prospects of obtaining water by boring or sinking is not good, and except where the granite is much weathered or decomposed, or fractured and disturbed by dyke intrusions, or laminated, not to be recommended Unfortunately these conditions are not much in evidence,

though they do occur on a few of the farms visited, and it is quite possible, that with a more extended and careful search, than the time at my disposal permitted, may be found to exist to a still larger degree. Where either of these conditions prevail sinking or boring may be carried out with a reasonable hope of success, provided of course, there is a sufficient catchment area draining towards the site chosen.

In the granite areas oozings or small springs (M'seynas) frequently occur, generally at an outcrop of the hard granite or at the base of a small kopje on the slope of the formation. There is a very popular belief that these springs emanate from some deep seated source in the solid rock, and that by opening them up, a stronger flow of water will be obtained. Their existence is simply on account of the nearness of the hard, imperious granite to the surface, which, with the aid of rank vegetation, holds up the water derived from the summer rains, causing it to flow gradually along the slopes of the surface of the hard rock until arrested by an outcrop, when it rises to the surface in the form of a spring.

It is quite possible that by removing these barriers a temporary increased flow will result, but it must also be borne in mind that the larger the breach, the sooner will the supply become exhausted. If it is desired to utilise these springs and retain them throughout the dry season, nothing should be done which would tend to create a faster or greater flow; on the contrary, every effort should be made to retard it. A simple method of utilising these springs is to construct at the eye of the spring, a small dam or basin protected from the sun and wind, just sufficiently large to draw from it what water is absolutely required.

In the granite areas the aim should be conservation of the surface waters in the manner above proposed for stock purposes, and the construction of dams in the rivers or spruits for irrigation purposes. As dams become breeding places for mosquitos, they should be constructed as far away from dwellings as possible.

The schists and the sandstones are the two great water-carrying formations of the country. Unlike the granite area, where the shallow sub-soils are capable of retaining only a very small proportion of the summer rains, the deep rich soils in the valleys overlying the schists readily absorb it.

There is little run off, and what is not retained in the soil finds its way to the rock below, into which it permeates along the bedding planes of the line of strike. This readily accounts for the absence of surface water on the farms in the schist area. The rains soak in and do not carry away the rich ingredients in the soil.

In selecting sites for boring, care should be exercised to avoid the hard seams or belts, and particular attention must be paid to the existence of intrusive dykes across the formation or flow of water—the flow of water being along the line of strike of the rock.

Where hard belts occur sites should be chosen on either side of the dip of the rock, but preferably at the back of such dip. Should a dyke exist, the upper or catchment area side of it should be selected.

In the sandstones areas as in the schists there is little run off the rains. The porous nature of the soil and rock allow of ready absorption. The water is distributed generally throughout the formation and little difficulty should be experienced in obtaining water by boring throughout the entire area. Where dykes exist the same precaution should be exercised as recommended in the case of the schists.

Generally speaking, water will be more readily obtainable in the valleys than on the ridges or hills as, naturally, water must gravitate to the lowest levels unless held up by dykes or other similar obstructions. Unfortunately it is on the elevated sites that supplies are mostly required for domestic and other uses and where, from a hygenic point of view, homesteads and dwellings must of necessity be established. While there is no difficulty in pumping the water from the lower to the higher levels, the distance and elevation adds considerably to the cost. It is obvious that an extensive subject of this nature requiring as it does so much practical experience cannot be satisfactorily dealt with in a report of this nature, nor may the many varying conditions under which water is found to exist be fully explained, but I trust that the foregoing remarks may be of some help.

If I might suggest in what manner the farmer could be further and more permanently assisted by the Government in a matter so vital, not only to his own welfare, but to the

welfare of the country generally, I would strongly recommend:—

1. Some permanent arrangement by which farmers may receive advice in the selection of sites for boring for water, and the construction of dams for the conservation of water for irrigation purposes and the taking out of furrows, etc. Such an arrangement would not only be desirable in itself, but would be necessary in the event of either of the following suggestions being adopted.
2. The establishment of a Government Boring Department to bore for water at cost price; or,
3. The granting of short loans at a low rate of interest on approved sites and by approved qualified con'ractors, and for the purpose of suitable pumping machinery, piping and material, for irrigation works generally.

The necessity for the adoption of the recommendations contained in No. 1 is so obvious as to need little comment. Too much money has already been wasted in the search for water on impossible sites and on ill-advised irrigation works. Much can be done to aid production and enhance the value of the land by small irrigation propositions, if only advice is available for the initiation of suitable schemes.

No. 2 is no doubt the ideal method of conducting boring operations, provided the energy of the department is directed to field operations, and not too much to office routine. The cost of such a department would of course be recovered in the charges for boring,

No. 3 is an alternative to No. 2, and while assisting the farmer to a similar extent, without any direct money grant, would encourage an industry in Rhodesia which has proved so eminently beneficial to other parts of South Africa.

As regards the granting of subsidies for boring, I regret that experience gained in the Cape Colony does not justify me in recommending it, neither do I think the conditions of Southern Rhodesia are such as to necessitate it. From personal observations I am of opinion that the farmers as a whole are willing to refund any money judiciously expended on their behalf, and would gratefully welcome any assistance which the Government might give in the directions I have indicated.

I have the honour to be, Sir,

Your obedient servant,

H. M. OAKLEY.

Wireworm or Hairworm in the Melsetter District.

By E. M. JARVIS, M.R.C.V.S., G.V.S., UMTALI.

Many farmers blame the importation of Merinos by the Rhodes' Trustees for the introduction of "Wireworm." From personal observation extending over eight years, the writer cannot bear out this statement, as the parasites exist in sheep in localities to which the said Merinos have never had access. That it was undetected or passed unnoticed is, perhaps, nearer the truth.

After the decimation of the cattle by Coast Fever, attention began to be paid to the systematic raising of small stock, where formerly just a few had been kept for slaughter. These were allowed to run at large untended in the immediate vicinity of the house, receiving no proper shelter or attention. Some deaths did occur, but the carcase was usually given over to native servants, no post-mortem examination was held and the cause of demise remained therefore unknown. On some farms no small stock had been kept at all. A sudden boom ensued and not a few men who had no experience of sheep farming rushed into the business. For a time all went well, but danger lurked near unsuspected in the form of verminous and other parasites. In the first years a few deaths occurred which were not taken much notice of by the majority, and then, suddenly, we heard of heavy losses which have filled the sheep master with dismay during the last two years.

Wireworm is known in Europe, America, Asia, Africa and Australasia, and on many of the adjacent islands, and has caused much loss in many parts of the world.

It would serve no useful purpose to give technical names and descriptions, so they have, as far as possible, been avoided in this article.

In the fourth stomach or abomasum and small intestines of the sheep, one finds small hair-like round worms of a flesh colour, in length about half an inch. They are best demon-

strated by taking some of the food contents and placing a little in a saucerful of water. On agitation the small worms may be seen floating in the water and are easily detected against the white background of the saucer. In the Colon, Cæcum, and floating Rectum, which comprises the large intestinal tract, are found rather larger wirelike worms of a dull white colour about an inch in length.

Within the walls of the intestines one often sees small tumours containing the larvae of worms, which are not easily distinguishable except with the aid of a magnifying lens.

Commencing with the worm in the alimentary tract of the sheep or goat, we find them in a state of sexual maturity. The fecundated female lays her eggs or partly formed larvæ or young, within the mass of digesting food. These eggs or larvæ are passed out with the dung to rest on the pasture or in standing or sluggishly flowing water. On the pasture and with favourable conditions of warmth and moisture, the egg gives forth a larva which is capable of motion through a watery medium, or if conditions are not suitable, it may remain at rest among the grass roots. When dew or rain moistens the grass the tiny parasites wend their way to the grass tips, awaiting a host's arrival. A sheep nibbling the grass tips swallows the immature worms, which when inside the digestive canal, rapidly develope into a mature and sexual condition to continue the multiplication of their kind, and to repeat the cycle of life. All authorities a gree that the harm these worms do is dependent on the degree of infestation, or in other words, on the number of worms present in the alimentary canal. An invasion by a few would lead to no symptoms of ill heatth and might pass observation. Should the worms at this period remain unnoticed, and the flockmaster be not alive to the danger, and have not instituted preventative measures, he will of a surety before many years have passed be dismayed at his losses, and be disheartened at his ineffectual attempts to cure the stock.

One fecundated female worm can produce hundreds of eggs, so that wherever the infected sheep leaves its excrement there larvæ arise. From this it is easily conceived how quickly a pasture can become bestrewn with larval worms,

Should an infected flock have narrow a range of grazing, a gross infestation of pasture is soon arrived at. Should the flock depasture over extensive, areas the rate of infestation will be slower. From American experiments it has been demonstrated that the veld when denuded of small stock remains infested for as long as fifteen months.

The earlier symptoms of the infestation of the large intestinal tract are, slime covered dung, loss of condition, bloodlessness of the visible mucuous membranes (mouth, eyelids, and those below the tail). The dung does not usually bear the characteristic pellet shape, but is a soft packed mass in which the worms may occasionally be detected on picking it over. The coat is harsh and staring, not infrequently infected with lice and scab. As the disease progresses the sheep becomes weaker, the heart's action is impaired, with the result that swellings appear under the jaws and throat. The animal frequently suffers from looseness of the bowels and where this is present the parts about the tail, particularly in woolled varieties, are much caked up with faecal discharge. In advanced cases the normal bowel movements (peristalsis) are either very sluggish, leading to a "pot bellied" condition, or they are much quickened, with frequent evacuations, and the animal becomes "herring gutted."

A certain amount of colic is present, causing the sheep to stand in a cramped up condition with drooping head, arched back, and with legs inclined inward as if resting on a pedestal.

The carcase is emaciated, with little or no fat to be seen. The parts where the fat usually is present are filled with a white jelly like fluid in which occasional opaque particles of fat may be detected.

Between the skin and the meat, a watery fluid is often present, particularly so under the jaws and throat. The heart is flaccid, surrounded by a white jelly-like fluid, and in the heart sac is often found a considerable amount of watery fluid which does not form a clot on exposure to air. The lungs are pale with occasional circumscribed areas of inflam ation or other complications to which a debilitated constitution lends itself. On opening the abdominal cavity, a

dropsical fluid often escapes, the serous membranes are clear, glistening, without any deposition of fat, some jelly-like or watery fluid in the caul, and around the stomachs and larger blood vessels. The abdominal organs, excepting the digestive tract, are usually normal in appearance. The liver, however, often contains a thread-like tapeworm in its bile ducts, and several "water bags" or hydatid cysts hang pendulaus from various parts of the serous membrane.

In verminous invasion of the abomasum there are to be found many small pink hairlike worms and if the infestation be gross, the stomach is dilated, the mucous membrane thickened, with reddened areas where many worms are collected at one spot. In verminous invasion of the large intestines many white wire-like worms are found lying next the mucus coat. The ingesta is also slime coated, mixed in blood-stained ropey mucus. The mucus membrane is much thickened and the lumen or channel of the colon (that portion in snake-like coils) is often much constricted. This portion of the bowels is seldom searched by sheep breeders, so the presence of the wireworm remains undetected. In the writer's personal experience this part of the tract is nearly always grossly invaded. The ingesta in the rectum is "pat like" and has usually lost its normal pellet form.

In many instances farmers do not willingly impart information as to their losses, but a computation has been made that about 2,700 head have succumbed to wireworm during the last two years in the Melsetter District, a loss of 10 per centum on the estimated numbers of small stock owned by Europeans at the commencement of 1907. One unfortunate breeder has but one lamb left out of a flock of 400 head. Other farmers will undoubtedly come in for the same losses unless forewarned.

The medicines employed by most farmers consist of bluestone in powder and solution, Cooper's Dip and salt in proportions of one to nine, sulphur, lime, and salt licks, Stockholm tar, various proprietary and empirical mixtures of varying strengths, some poisonous and some harmless. Most of the proprietary powders and pills were examined by rough chemical tests which showed them to contain without

exception a combination of some of the various medicaments mentioned above. Few breeders whose sheep were badly infected had to report successes in their treatment, and where faith was pinned to a given remedy one mostly found that it employment was too recent for definite conclusions to be formed as to its efficacy.

The following conclusions as to causes in failure in treatment in the Melsetter District were arrived at :—

1. Foremost, the contaminated condition of the veld has been overlooked and not allowed for.
2. Insufficient faith in the particular medicines employed.
3. In the desire to cure the stock at one attempt too heroic measures have been tried with corrosive agents like arsenic and bluestone in too great a proportion, and harm is done to the stomach and intestinal walls, from which the small stock never recover.
4. Insufficient salt supply.
5. Insanitary condition of sheds.
6. Want of extra feed for winter use, leading up to semi-starvation in the dry season.
7. The average farmer is indifferent about "poor doers" on his pastures, and is ready to oblige his neighbour with grazing for diseased flocks for the mere asking and without enquiry.
8. Too much reliance is placed on native herd boys.

The Native breeds, Persian and Merino, and crosses between Native, Merino, and Persian were all said to be equally affected.

Varied are the local opinions expressed as to whether the District is suitable for sheep farming, and many decry the country and state that it is useless for the purpose. A few facts will assist to a proper decision on this point. The numbers of small stock, European owned, have increased steadily, as the following details will show :—

1905	...	Inconsiderable and no return.
1906	...	9,000
1907	...	12,000
1908	...	25,000

Until wireworm make their appearance sheep do well. Many farmers have possessed large flocks over many years and state it is all a question of supervision. Good running water abounds. Green grass can be obtained on nearly every farm by judicious burning the whole year round. The varied crops and fruits which grow to perfection by cultivation prove little deficiency in quality of soil. The herbage is very varied, and comprises specimens of not a few natural orders of plants suitable to animal economy. Small stock abound at many native kraals.

The farmer about to enter upon sheep raising should employ the following measures and precautions:—

1 That he buys none but robust, good conditioned stock.

2. If "weeds" or "poor doers" be amongst his purchases, cull them out and if unable to dispose of them kill them off and make his first loss his best.

3. Dose all and every sheep bought at an out of the way part of the farm before admitting it to its future grazing ground.

4. Select the drinking places for the flocks at running streams. If compelled to make use of sluggish waters, run the same into a dam, the floor of which should be sprinkled with a little lime and be paved or rammed with stones. Protect the head waters by fencing them off or planting a protecting belt of trees. Cut a sluit or drain some distance above the dam to lead the water in, and have a pipe at the lower face of the dam wall through which the dam can be emptied. Fresh water should be run in at least every third day.

5. Map your farm out into as many sectional areas as possible, and personally see that the flock goes to the area which is allotted for the day. Change to a new area at least once a month. Grazing day in and year out on the same veld is a mistake, because of verminous contamination and because the sweet grasses and delectable herbages are too closely cropped and often are exterminated.

6. Avoid vlei or marshy ground as grazing areas. Better plough them up and grow barley, lucerne, root crops, or what will do best in them. Use the crops as accessories to winter grazing.

7. Every sheep should receive one and a half pounds of hay, barley, or roots per diem during the months July, August, and September.

8. Always have on hand a lick composed of slacked lime (or bone meal) one part, and common salt ten parts.

9. It is best to keep the lick in a holed or self-feeding trough. They are easily and inexpensively constructed. The licks in open troughs are invariably filled with dirt, and nasal and faecal discharges.

10. The sheep sheds or kraals should be swept out daily and the manure removed to a pit or lands and well covered up with earth, and if no eventual use is made of it, it should be burned.

11. Cleanliness and freedom from parasites will assist the sheep's resistance to verminous invasion, and some authorities go so far as to state that if the animals be maintained in good condition, there will be no parasite invasion. For this opinion there is much to be said. Dipping with insecticides should be carried out at least once every three months.

12. Never fail to inspect your flock night and morning. Any ailing or debilitated animal should be withdrawn, dosed, fed, and kept in isolation from the main flock. If the animal be not worth extra care and attention best make away with it then and there, and do not let it loose to fend for itself and linger in sickness. This is a false policy in sheep farming.

To breeders whose flocks and pastures are already infected it is recommended that they make up their minds to carry out the measures given below, or give up sheep farming.

1. Dose the flock right through once in their present kraal, and a second time after removal to a temporary site.

2. Construct a new kraal on a part of the farm removed from the old grazing areas and place the sheep therein after carrying out the preceding provisions, and immediately after the action of the medicine has passed off.

3. From then onwards act on the advice given above to those who wish to avoid having the disease amongst their sheep.

The late Chief Veterinary Surgeon of Cape Colony, Mr. Hutcheon, used to recommend bluestone solutions, made of the purest materials, and also favourably endorsed the Cooper's Dip or arsenic and salt treatment. American Veterinarians advise gasoline. The writer favours a non-poisonous and non-irritant paste, made as follows:—

Castor Oil or Epsom Salts	...	2 ounces.
Stockholm Tar		1 „
Mustard, ground		½ „

The above dose is for an adult sheep in fair condition; young lambs should receive a dessertspoonful of this mixture. Whatever medicinal agent be employed, a period of fasting must precede the dosing, and where the sheep are strong enough to stand it they a best brought in at noon on one day and kept until noon the next before being dosed.

The method of dosing with these solutions and powders has not been entered into as they appear in various publications and are known to all who claim to understand sheep farming. The paste in question is given with a spoon, the mouth opened and the medicine smeared on the tongue. Sufficient time should be given for the sheep to swallow the the dose whilst head is retained. The counsel to change from contaminated pasture and kraal to clean areas after each dosing cannot be reiterated too often.

The Cost of Agricultural Operations in Southern Rhodesia.

PARTICULARLY AS APPLIED TO MAIZE.

By H. GODFREY MUNDY, Agriculturist and Botanist.

Much difference of opinion exists as to the cost of producing the various farm crops commonly grown in South Africa. As far as the writer is aware no systematic effort has yet been made to arrive at any definite figures, and the object of the following article is to put forward in a concise way the various agricultural operations which are entailed in producing a crop of maize, and at the same time to estimate (a) the cost of each individual operation, (b) the total cost of production.

The difficulty of arriving at representative figures is considerable, firstly owing to the great variations in the price of labour in different districts, secondly because a large proportion of farmers do not know exactly what area of land they are working, or what is their average day's work with any particular implement. Further there are differences of opinion regarding the necessity of feeding farm animals during winter and the cost of such feeding where it is practised the amount of winter feed necessary to keep stock in good condition is influenced by the character of the native grasses and the general climatic conditions of each district in question. Lastly some farmers do not consider it necessary to allow for depreciation of trek oxen, but on the contrary consider that where young cattle are used these increase in value rather than depreciate.

The writer is aware that in dealing with a matter of this kind he lays himself open to a deal of adverse criticism from those holding different opinions to his own, but it is hoped that such criticisms will only prove beneficial and will serve to raise further interest in this important subject. Correspondence, through the pages of this Journal, is invited and any reliable figures which can be brought forward either in support of or against the conclusions arrived at in this article, will be cordially welcomed.

Agricultural progress is making rapid strides throughout the whole of South Africa, and evidence is not wanting that a large, and it is to be hoped increasing export trade in maize, is being built up. The old era of rule of thumb, hand to mouth farming, is gradually passing away, and with its disappearance comes the need of a more thorough knowledge of what our crops cost to grow, and, given normal seasons, what profit per acre can be expected. Business methods are no less necessary on the farm than in the commercial house, and it is believed that when the cost of growing the various crops is more fully realised, more attention will be paid to the vital importance of using nothing but the best seed. In either case the necessary tillage operations will amount to approximately the same, and if by using the best seed the yield per acre may be increased by two, three, or even more bags per acre, as undoubtedly is the case, it stands to reason that the nett profit will be increased accordingly.

As has been said, one of the chief difficulties is to arrive at an estimate of a fair day's work with any particular agricultural implement. Data regarding this point has, however, been collected for some considerable time, and the figures accepted are the averages reported by some of the most progressive farmers of the Transvaal and of Southern Rhodesia. Similarly the price of labour has been reckoned on the current rates of wages, while the yield per acre together with the cost of feeding mules and oxen have been arrived at in a like manner.

In lightly discussing the cost of agricultural operations it is not uncommon to totally disregard capital outlay. If however, it is intended to draw up estimates on business like principles, due regard must be had to capital outlay, and moreover depreciation of both stock and implements must be taken into account.

In the following computations, 5 per cent. per annum has been allowed as a fair rate of interest on monies invested. It may be argued that this interest is not sufficiently high but in other respects maximum charges have been made and one item should therefore balance the other. The rate of depreciation is reckoned according to the estimated life of the article in question.

Such a farm as the writer has in view is common throughout South Africa, though it may be said in the usual course of events young trek oxen are born and bred on the farm and consequently increase in value up to the age of seven or eight years. Farmers who work on such lines will probably wish to delete the 15 per cent. depreciation on oxen, and in doing so will considerably reduce the cost of ploughing, cultivation, etc. It is presumed that two or three hundred acres of land will be under cultivation, and that the transport animals on the farm will include two spans of oxen (16 in each) and four mules. As often as not mules are not kept but even so the cost will be about the same, as though less work per diem will be done the labour of oxen is less costly than that of mules.

The first important point to determine is how much per day should be charged for the labour of each ox and each mule, and this is arrived at in the following way :—

BASIS.—Twenty-eight working days to each month. Cost of a span of oxen (16) at £10 apiece, £160.

Interest on a capital outlay of £160 at 5% = £8 per annum or 13 4 per month = 5¾d. per diem per span, or say ½d. per day per ox.

Depreciation on a capital outlay of £160 at 15% = £24, or £2 per month = say 1 5 per day per span, or say 1¼d. per day per ox.

The *work* of an ox therefore costs 1¾d. per day.

Feeding say 1¼d. per day per annum. This will allow 9 6 a month for feed during the four months of mid-winter (June 15th to October 15th approximately)—consisting of a small ration of maize or crushed corn and cob, together with veld grass, hay and maize stalks *ad lib.* If these figures are accepted, 3d. per day per ox will be the cost of labour plus cost of feed, or 4 - per day per span.

Cost of one mule, £30.

Interest on a capital outlay of £30 at 5% = 30 - per annum, 2 6 per month, or say 1d. per day.

Depreciation on a capital outlay of £30 at 20% = £6 per annum, 10/- per month, or say 4¼d. per day.

Feeding, 8 to 10 lbs. of maize, together with veld grass, hay and maize stalks *ad lib* a day throughout the five and a half winter months, repairs to harness and minor attendances, say 11/4 per month = £3 2s. 4d. a year or approximately 2¼d. a day.

Cost of one mule's labour plus food per day = 7½d.

Native labour has been estimated at the following rates:—

	Per month.	For rations.		Per working day.
Drivers	50s.	+ 5s.	= £2 15s.	or 2s.
Responsible boys ...	20s.	+ 5s.	= £1 5s.	or 1s. 0¾d.
Northern boys and such like	15s.	+ 5s.	= £1	or 8½d.
Herds and voorloopers	10s.	+ 5s.	= 15s.	or 6½d.

The cost of the implements is estimated on a generous scale, and is as follows: Interest on capital outlay is reckoned at 5%, and depreciation varies according to the probable life of the implement.

		Interest per cent.	Depreciation per cent.
Four-Furrow Disc Plough ...	£30	5	15
Disc Harrow, large	15	5	20
Zigzag Harrow, large ...	10	5	15
Planter, 2-rowed	15	5	25
Weeder	5 10s.	5	15
Horse Hoe, 2-rowed	10	5	10
Clod Crusher or Roller ...	10	5	10
Sheller, hand, large	10	5	20
Winnower, large	20	5	20

In working out the cost of each agricultural operation the value of the work of the actual implement itself (value consumed per acre for farm machinery) is arrived at, by calculating the interest on the capital outlay and the depreciation per diem on the particular implement in question. The following table gives these particulars, and in the second

column will be found an average estimate of similar costs in certain States of the United States of America :—

	Cost per diem in S.A.	Cost per diem in U.S.A.
Four-Furrow Disc Plough	4¼d.	2¾d. (mould board)
Disc Harrow ...	2½d.	1¼d.
Zig-zag	1½d.	¾d.
Planter, 2-rowed ...	3d.	3½d.
Weeder	¾d.	1½d.
Horse Hoe, 2-rowed ...	1¾d.	1½d.
Clod Crusher or Roller ...	1d.	(not estimated)
Sheller ... say	2d.	,,
Winnower ... say	3½d.	,,

Having now collected all the data that is required we shall proceed to work out the cost of each item in the production of maize.

PLOUGHING. The writer understands it to be a commonly accepted fact that on average land which has been once ploughed before, twenty-five acres per week can be turned over with a 4-furrow disc plough and two spans of oxen, sixteen in each. The cattle work in shifts, and the team that took the last shift one day will take the middle shift the day following, and so on.

	Per week. £	s.	d.
1 Plough at 4¼d. per day	0	2	1½
2 spans Oxen at 4s. per day	2	8	0
1 Driver at 2s. per day	0	12	0
1 Boy riding plough at 1s. 0¾d. per day	0	6	4½
1 Leader at 8½d. per day	0	4	3
Per 25 acres	£3	12	9

or approximately 2s. 9d. per acre.

Disc Harrowing, 8 acres a day.

	Per diem. s.	d.
1 Disc Harrow at 2½d. per day ...	0	2½
16 Oxen (in two spans of 8 each) at 3d. each per day	4	0
1 Boy at 1s. 0¾d. per day	1	0¾
1 Leader at 6½d. per day	0	6½
Per 8 acres	5	9¾

or 8¾d. per acre.

Zigzag Harrowing, 7 acres a day.

	s.	d.
1 Zigzag Harrow at 1½d. per day ...	0	1½
12 Oxen at 3d. each per day	3	0
1 Boy at 8½d. per day	0	8½
1 Leader at 6½d. per day	0	6½
Per 7 acres	4	4½

or 7½d. per acre.

Weeder, 10 acres a day, 4 Mules (in two spans).

	s.	d.
1 Weeder at ¾d. per day	0	0¾
4 Mules at 7½d. per day	2	6
1 Driver at 2s. per day	2	0
1 Leader at 6½d. per day	0	6½
Per 10 acres	5	1¼

or approximately 6d. per acre.

Two-Rowed Planter, 7 acres a day, 4 mules, (2 spans).

	s.	d.
1 Planter at 3d. per day	0	3
4 Mules at 7½d. per day	2	6
1 Driver at 2s. per day	2	0
1 Leader at 8½d. per day	0	8½
Per 7 acres	5	5½

or 9¼d. an acre.

Horse Hoeing. 8 acres a day, 4 mules (2 spans).

	s.	d.
1 Horse Hoe at 3½d. per day	0	3½
4 Mules at 7½d. per day each	2	6
1 driver at 2s. per day	2	0
1 Leader at 6½d. per day	0	6½
Per 8 acres	5	4

or 8d. an acre.

Clod Crusher, 7 acres a day, 12 oxen (2 spans).

	s.	d.
1 Clod Crusher at 1d. per day	0	1
12 Oxen at 3d. per day each	3	0
1 Boy at 8½d. per day	0	8½
1 Leader at 6½d. per day	0	6½
Per 7 acres	4	4

or 7½d. an acre.

HARVESTING.—It is estimated that with the rows 3 feet apart one boy will pick and husk the crop from 1,000 yards in 1½ days. That is to say a boy will pick and husk an acre in approximately 6½ days. Boys labour at 8½d. per day = 4s. 7¼d.

Cost of picking and husking an acre, 4s. 7¼d.

BAGGING IN FIELD.—Two boys bag a 1,000 yards in 2 hours, that is to say one boy will bag an acre in 2¼ days. Boys labour, 2¼ days at 8½d. per day = 1s. 7¼d.

Bagging in field 1s. 7¼d. an acre.

RIDING TO MAIZE STACK AT HOMESTEAD.—Estimated that on a large wagon two hundred and forty bags of cobs can be ridden per diem, or say the equivalent of 120 bags of shelled grain.

	per day. s.	d.
One Wagon at £80, interest 5%, and depreciation 10% per annum	0	6
32 Oxen (2 spans) at 3d. each ox per day ...	8	0
1 Driver at 2s. per day	2	0
1 Boy at 1s. 0¾d. per day	1	0¾
1 Leader at 8½d. per day	0	8½
Per 140 bags of shelled grain ...	12	3¼

That is to say 1·2 of a penny per bag, or at a crop of seven bags per acre, say 8½d.

Cost of riding to maize stack 8½d. per acre.

SHELLING.—There are several hand shellers on the market costing from £6 to £10, and estimated to turn out 30 to 50 bushels of shelled maize per hour. We have here taken it at 34 bushels or 10 bags an hour, and allowing for the desultory work of natives when shelling maize, at 60 bags a day,

Several farmers have reported an average shelling of 60 to 90 bags a day.

	s.	d.
1 Sheller at say 2d. per day	0	2
8 Boys at 8½d. per day	5	8
Occasional supervision of white manager, say 5s. per day	5	0
Per 60 bags shelled grain ...	10	10

That is 2¼d. per bag, or at 7 bags per acre, *1/3¾d. an acre.*

WINNOWING.—Winnowers are sold at from £15 to £20, and estimated to clean 60 to 90 bushels an hour. If we take 75 bushels an hour as an average for six hours a day, approximately 140 bags of grain can be winnowed in a day.

	s.	d.
1 Winnower at 3½d. per day	0	3½
8 Boys at 8½d. per day each	5	8
Occasional supervision by White Manager, say 5/- per day	5	0
Per 140 bags of grain winnowed ...	10	11½

That is, say 1d. per bag, or at 7 bags an acre, *7d. per acre.* In one case the total cost of harvesting has been reckoned at 5½d. per bag.

Cost of bags, say 9½d. each.

COST OF PRODUCTION.—Having worked out step by step the cost of each individual operation, we are now in a position to consider the total cost of production.

In estimating the above costs the writer has in every case endeavoured to err on the side of charging too much rather than too little, and of allowing the maximum number of animals which can be considered necessary. In the same way, when calculating the amount of work done per diem, a low rather than a high estimate has been sought for.

In regarding the cost of production, many farmers will probably claim that the number of tillage operations allowed for is in excess of what is usual, and that were such operations given the resulting crop should certainly exceed seven bags an acre. This may, very possibly, be so, but here again the object has been to avoid underestimating and to represent the maximum cost of growing maize, on average land of moderate fertility.

Total cost of growing an acre of maize, 7 bags an acre.

	s.	d.
First Ploughing	2	9
Disc Harrowing	0	8¾
Cross Ploughing	2	9
Harrowing	0	7½
Planting	0	9¼
Three Harrowings	1	10½
Two Weedings with Weeder	1	0
Two Horse Hoeings	1	4
Picking and Husking	4	7¼
Bagging in Field	1	7¼
Riding to Maize Stack	0	8½
Shelling	1	3¾
Winnowing	0	7
Bags, 7 at 9½d. each	5	6½
Selected Seed, at 20/- per 200 lbs. (grown on the farm) ...	1	6
Per acre ...	£1	7 9¼

or 3/11 per bag on the farm.

To this must be added the cost of riding maize from the farm to the nearest railway station, together with railway freight to the market. As these charges differ so much according to distance of the farm from the railway, and thence to market, it is impossible to estimate them here.

Rent of land being another very variable item it has also been omitted, but both these must be reckoned in before the complete cost of production can be arrived at. In following out these figures to their conclusion there is one point which will strike every thoughtful reader, namely, the small proportional cost of seed, and the little expense which the minor operations of after-cultivation, such as harrowing, weeding and horse-hoeing, entail. The moral of this is obvious, namely, that, if by using none but the best selected seed, and if by indulging the crop in a few additional after-cultivations, the yield per acre can be increased by two or three bags, then the gross profits will be considerably enhanced, and this at very little additional expense. The main items of expenditure, except those of picking, are the initial costs of preparing and planting the land, and this is a strong argument against the too frequent practice of cultivating larger areas of maize than can be properly worked in such a way that the maximum yield is obtained.

Friesland Cattle.

[CONTRIBUTED.]

The Friesland breed of cattle, natives of Holland, were introduced into South Africa during the early period of the Dutch occupation, and records of exports of Frieslands from Holland for Africa can be traced to the years 1800-1801.

Breeders of Frieslands have taken such care in the maintenance and perpetuation of the distinct characters which the breed possess, that it is recognised to-day as one of the purest and most perfectly standardised types of cattle in the world. The purity of breed is shown in a marked degree in the progeny of our African native cattle amongst which Friesland sires have been introduced.

The main economic qualities of the Friesland breed are their high milk producing powers, their early maturity their eminent suitability for "grading up" common stock and their adaptability to African conditions. The average milk production of the Frieslands is higher than any other breed, and they are specially fitted for the raw milk trade, but farmers find it wise to keep amongst their herd of Frieslands for such purpose a small number of Jerseys, Ayrshires, or crosses of these breeds, or even some of our native cattle, which will increase the butter fat in their milk supply. Milk from Frieslands produces first class cheese and is second only to the Ayrshire for this purpose. The Friesland is not a beef breed but crosses produced by the sires on our African cattle will not suffer any deterioration in their meat producing qualities.

Friesland cattle can be described as a very active breed, whose limbs (especially in the females) are fine and light in build, carrying large roomy bodies with ribs well sprung and widely set apart. The recognised standard colour of the Friesland is black and white, although true specimens of the breed are to be found which are a whole black colour, black with white points, grey and white, red and white and dun coloured. The favourite colour, however, is undoubtedly black and white, although it should be remembered that a black or coloured Friesland is permissable, and should not disqualify in a Show ring,



Photo by] Eric A. Nobbs

Arrival of Ost Friesland heifers at Salisbury station after a journey of six weeks from Norden, Germany

The head of the Friesland animal may be described as short from the crown to the muzzle, showing great width of forehead and between the eyes. The eye of the Friesland is small, active and piercing. The horns short (in the bulls exceeding by very little the length of the ear), and should curve slightly in an upright position for preference. The muzzle should be flesh coloured or black. The neck of the Friesland is longer in comparison to that of the Shorthorn and, in the case of the bull, should have that thickness together with breadth of chest which denotes strength of constitution, so necessary in a sire. The feet, which should for preference be black in colour, must be set on square to assure good travelling powers, which are required, especially when search for food and water becomes necessary.

There are two types of Frieslands generally recognised in South Africa, the heavy type and the medium-sized type. Both types have their good qualities, but the medium finds the most favour with our farmers. The large Friesland is an animal which will "pay for the keeping" in countries which possess richer natural pasturage than is to be found in this country, and where animals do not have to travel very far for the large amount of good food which they must have for their existence, and for the production of profit for the farmer.

The legs of the medium-sized Friesland must not be too long, or too coarse, but strong enough to carry the body. They must be squarely set on, and well set apart with no inclination to the formation of "knock knees," or "cow hocks," which are sure indications of weakness in constitution. The body proper (barrel) should be large, roomy, and of good even depth with ribs well sprung and set a good distance apart. The thigh should be well developed and stand well out. In the cow the udder must be large, with smooth velvety skin, teats of average size, set square and well apart from each other, and should preferably of a black colour. The hips of the Friesland must not be too high, but should be broad, running as near as possible square with the thigh bone. The tail should be thin and tapering and should not fall below the level of the hocks. The shoulder should not show a tendency to be fleshy but should be light. The skin of the Friesland must be fine and sleek, covered with a fine short hair. The escutcheon should be of good width, which shows heavy milking qualities.

In Europe there are a number of closely related breeds, not incorrectly described as varieties of the one great black and white (German "Schwartzbunt") race. To the casual observer they are all alike, and even to the trained eye it is often impossible to distinguish the one breed from the other, yet there are distinctive peculiarities, and the admirers of each claim for their own some special excellence, but the real distinction lies in the fact that the area for each breed is now limited and that it is no longer permitted to introduce fresh blood from one to the other. The effect of this artificial restriction has been that different principles of breeding have resulted in the evolution of certain types which are ever being accentuated and specialised. Thus in certain districts demand and natural conditions have led to the formation of a more early maturing butcher's type, elsewhere size has been aimed at, and yet again milk production has been the chief end in several cases.

The home of the black and white cattle has for ages been the fat pastures of the lower Rhine Valley, the low countries and the salt marshes along the shores of the North Sea.

Foreigners, especially Englishmen, have come to regard all these breeds of cattle under the generic title of "Dutch," while at the Cape of Good Hope "Friesland" is equally vaguely applied. As a matter of fact in these loose designations are included Groningen. Amsterdamer, Preignitz, Lower Rhine, Westphalian, North Holland, West Friesland, East Friesland, etc., etc.

Besides the cattle from Holland, two other types of Frieslands have recently come to the notice of South African breeders, and their several advantages to our conditions are already being appreciated. The types referred to are the Ost-Frieslands and the American Frieslands.

Friesland cattle from America, or as they are often called on that country Holsteins, seem to have found their way to the Cape chiefly as milch cows on ships, which, being bought by Capetown dairymen, have often proved great milkers, They are usually of the big framed type, more suited to the town than to the veld. Occasionally shipments of pedigree Holsteins from the States have taken place, and of these animals it may be said that they come of ancestry of proved



Photo by] [Eric A. Nobbs

Front view of Mr. Macarthur's Bull

merit, as the American breeder pays the closest attention to pedigree and performance at the pail. At least one such consignment to Rhodesia has taken place.

In the month of September of this year there arrived at Salisbury a consignment, imported through the medium of the Department of Agriculture, of eleven heifers for Messrs. Maclaurin Bros. and a bull for Mr. Macarthur of Hillside, all of the Ost-Friesland breed. As these are the first specimens of the breed seen in Rhodesia, and have given entire satisfaction so far as appearances and promise go, some account of the breed may not be out of place.

The Ost Friesland breed resembles in all essentials the other branches of the great black and white race but has gained for itself a wide-spread reputation in foreign countries. It is largely exported to Russia, Silesia, Austria and even to Italy, indeed the chief object of the farmers of East Friesland is not dairy farming, though that is largely followed, but the production of bulls and heiters for export. The great public fairs held at the local centres of Emden, Norden and Leer, in May and again in October and November, attract buyers from all over Europe, and between 25,000 and 30,000 head are exported annually. Such is the popularity of the breed in Europe.

One of the most striking peculiarities of the breed is the great uniformity shewn amongst its herd-book and stud animals. This implies a fixity of character, and trueness to type that is very desirable for animals brought into new conditions where any tendency to sport or degenerate is always aggravated, and also for crossing purposes where it is desired to impart to the progeny the qualities of the new breed.

The first aim has been the production of milk of high quality in abundance, but this only so far as it is compatible with a fair sized carcase and good fattening capacity. This combination cannot by any possibility be combined with early maturity such as is to be found among the pure beef breeds, such as Aberdeen-Angus, Galloway or certain classes of Shorthorns. It is claimed for this breed that they surpass others in vigour of constitution and in freedom from tuberculosis and similar ailments. The breed is certainly in the first instance a dairy one, and more particularly intended for the production of milk for consumption fresh and for butter making; cheese is little

made in Ost-Friesland, the skim milk with artificial substitutes for the fat removed in the cream being required for rearing the calves. From carefully selected statistics covering the whole breed the average quantity of milk obtained from a cow per lactation of about ten months is about 6,000 lbs. (actually 5,928 lbs), while cases very much higher have been recorded. As a breed the cows, while thriving on a low diet, respond very well to forced feeding, such as is given in town cowhouses. This faculty is quite characteristic and innate.

Some details of the methods of rearing in Ost Friesland may be of interest. As regards bulls a striking peculiarity is that they are used at the early age of from ten to sixteen months. This is due to the keen demand which exists for young bulls for export at the great local sales. This policy is severely criticised as it is held that by so doing the breeders lose every opportunity of judging of the merits of an animal by his progeny and further that the bulls are used before they are fully developed and grown out, hence it is impossible to know their quality. On the other side it is claimed that the practice has for long continued and proved satisfactory; that young bulls are required for the heifers, old bulls becoming heavy and bad tempered; but these are mere excuses the real reason lies in the keen demand which exists for young bulls. Heifers usually calve at three years old, earlier only on the richest pastures, and the favourite calving time is February, March and April. At first the cows have to be milked four or five times a day, then three times, and after the grass begins to grow and they go out to graze, twice. The calf is at once removed from its mother and is hand fed from the beginning, getting all the beastings and full milk for the first ten days or a fortnight, after which it is fed on skim milk with substitutes for the cream, oatmeal or linseed meal and a little of the best hay. After four weeks the milk is gradually reduced and the calves are turned out to pasture but are given the buttermilk or whey. Through the long cold months they are kept chiefly indoors and fed on hay, straw, mangolds and two or three pounds of oat or rye-meal or linseed cake per diem in three feeds. The cows are only allowed to be dry for about six weeks before calving; formerly from eight to ten weeks rest were given. With a view to retaining good stud animals premiums are offered to the owners of certain selected young bulls in accepting which

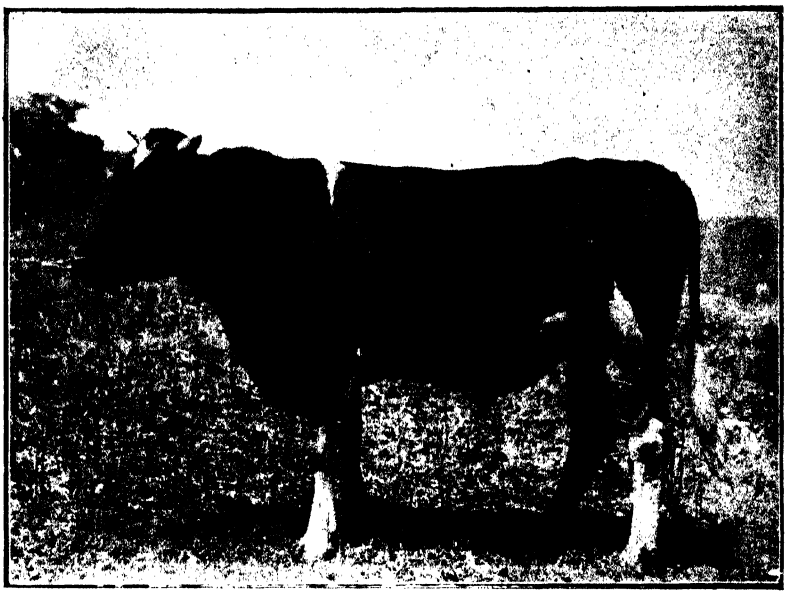


Photo by] [Thwaites

Friesland Bull, the property of C. C. Macarthur, Esq.
Bred by R. Cross, Esq., Queenstown

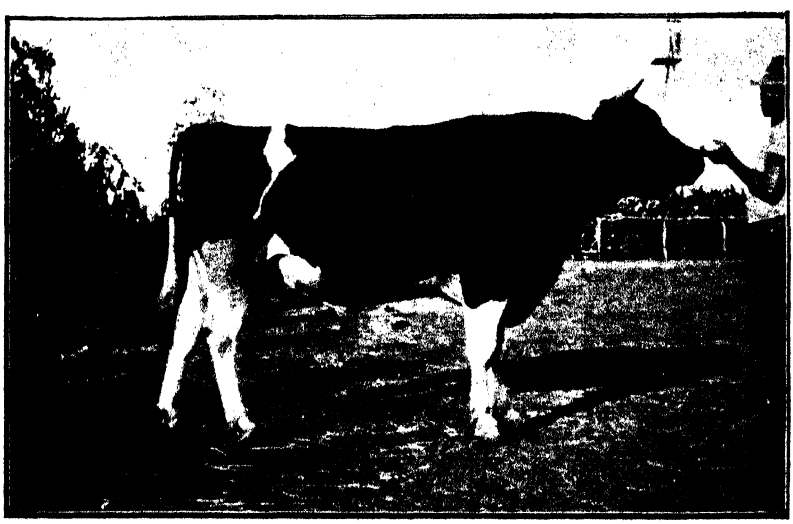


Photo by] [Eric A. Nobbs

Friesland Bull, the property of C. F. Browning, Esq., Salisbury
Bred by R. Cross, Esq., Queenstown, C.C.

the owner binds himself to retain the animal two years for use at the low fee of five marks (about 5s.). Approved bulls must all have passed the tuberculin test.

In order to promote and safeguard the interests of the breed, a society has long been in existence under Government control which has been of the utmost service in encouraging trade and in directing the policy of breeding. Its efforts have been crowned with considerable success; the improvement of quality has been rapid, and a uniformity obtained among the herds which gives confidence to foreign buyers and greatly aids purchase.

The present fashionable markings are as follows: A black head and neck with a white star on the forehead, white bando over the withers and loins, belly and legs below the knees white, white purse and udder and white tip to the tail, the remainder, viz., the back from the withers to the loins and well down each side, and tail, head and rump all black. Animals with different markings are quite pure but the nearer they approach to the above the better they are liked. Apart from these colourings referred to, a pure white face is considered a throw back to the Dutch form, while altogether black animals are not looked upon with favour. The eyelids and muzzle should be blue black but butterfly noses are common even on prize stock and all markings must be sharply defined, not merging the colours at all.

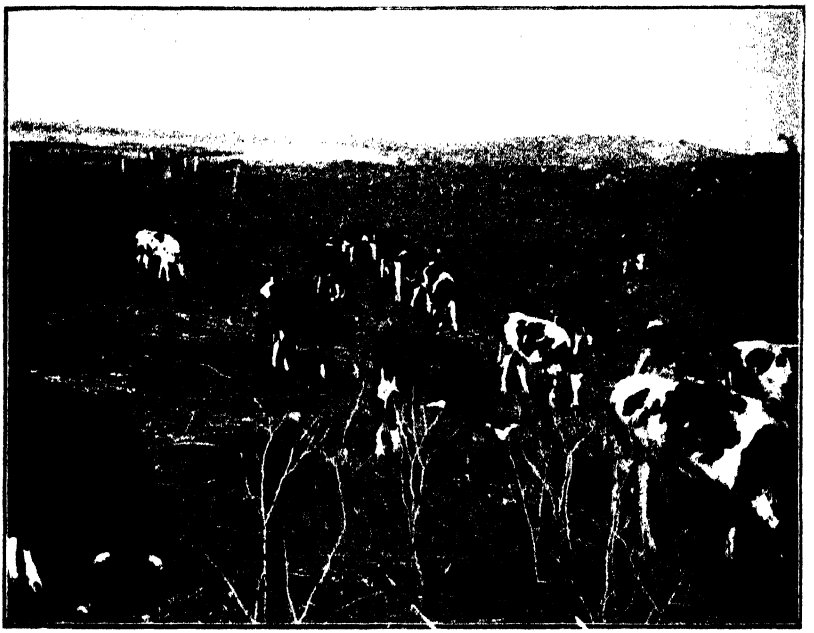
The feel of the skin must be soft and fine, the hair short, flat and silky but mossy in cold weather, the skin at the neck and shoulders should show a number of fine parallel creases. The frame is large but the limbs are fine and long, with free movement in walking. The muscles are strong and prominent and the general impression is that of medium flesh-forming powers with great milk capacity. The head is of medium length, the face finely chiselled, the nose straight, and nostrils broad and sensitive. The jaws are fairly strong, the forehead short and narrow, bearing a fringe, and fine shiny milk-white black-tipped horns about ten inches long and curving forwards and often slightly downwards, not gaily carried as in the Ayrshire breed. The neck is of moderate length, finely folded as above described, and with but a small dewlap. The withers are moderately wide, rising only slightly above the neck and general line of the back,

which is not as straight as with the short-horn or other beef-breeds. There is often a slight rise from each end to the point where the hairs turn in the middie of the back, and this is to be preferred to any tendency to hollow backs. The vertebrae from the loins to the tail head are inclined to be prominent and to fall away somewhat; this is not considered a fault, it is characteristic of the breed. The shoulder is long, sloping and muscular, the ribs are not strongly arched in front but are well sprung behind, adding to the general wedge-shaped form so typical of milking breeds. The loins are broad, level, long and rectangular, and it is below this point that the depth is greatest, the hip bones are prominent and strong and the whole pelvic region is well developed. The tail is set on low and lies in a deep groove between the pin bones, which gives a somewhat plain appearance to this region. The joints of the limbs are clean and dry, the hoofs good and well placed. But the most important feature of the cow—the udder—taking the breed all over, is faultless, large and well shaped, running well forward and far back, broad and shapely with moherately long, not fleshy, well placed teats, and the milk veins and wells are distinct.

The mature bull is higher at the withers, longer in the body with shorter legs, and thicker set, broader shoulders than the female. Young animals complete their growth behind first and then become furnished forward; this must be remembered in examining young stock.

Of all European breeds of cattle introduced into Cape Colony the Friesland is predominant, and is mainly responsible for the greatly improved economic qualities possessed at the present day by the Cape cow. The parts of the Western Province of the Cape Colony which are looked upon as the home of the Friesland extend from the slopes of Table Mountain to the Malmesbury, Darling, Hopefield, and Piquetberg Districts on the north-west, and to Stellenbosch, Robertson, Swellendam, and Riversdale districts on the east. The breeders of Frieslands in the Eastern and Midland provinces of the Cape Colony are chiefly to be found in the districts of Queenstown, Kingwilliamstown, Tarka, Bedford, Somerset East, Colesberg, Middelburg, and Graaf Reinet.

The value of the Friesland breed to Southern Rhodesia is yet to be proved, but it may safely be assumed that should Friesland sires be judiciously used in conjunction with superior Afrikander sires, upon our native Mashona and Matabele breeding herds, the results cannot be anything but a satisfactory improvement in quality, size and constitution. At the same time it must not be forgotten that the pure breed is essentially a dairy type.



Mr. Maclaurin's Heifers



Mr. Maclaurin's Herd of Friesland Milch Cows

The Mines as a Market.

THE CROPS REQUIRED FOR NATIVE DIET.

By ERIC A. NOBBS, Ph.D., B.Sc.

The complaint is very frequently heard that Rhodesia has but one crop, mealies, and enquiries are constantly made for something else, a grain, fibre, oil or fruit to be grown as a staple and especially as a commodity for export. No doubt in time several such will be found, and the sooner the better, but meanwhile it may not be out of place to call attention to the existence of a demand, to the tune of something like £30,000 a year, at our doors, and of which a portion, larger at least than what is now being obtained, might certainly find its way into our farmers' pockets if the difficulties at present in the way could but be satisfactorily overcome.

Under the provisions of the Mines and Minerals Ordinance 1903 and The Precious Stones, Mining and Trade Ordinance 1906 it is, amongst other things, enacted that every native employed on any mining location shall be provided with rations of good quality and of fixed quantity consisting of meat, meal, vegetables, lard, and salt. The number of boys employed on the mines according to the latest returns obtainable is some 34,266, distributed as under:—

Bulawayo Mining District, embracing Bulawayo, Belingwe, Filabusi, Inyati, Gwanda, Bubi, Umzingwani and Wankies ...	9,027
Gwelo, including Gwelo, Selukwe and Que Que	7,577
Hartley	7,054
Umtali, including Penhalonga	3,611
Salisbury, Abercorn and Enterprise ...	1,445
Lomagundi	2,896
Mazoe	2,072
Victoria	584
Total ...	34,266

These figures are given in order to enable farmers to form some idea of the numbers to be fed in their vicinity. Meal, including native grains and mealies, is supplied at 2 lbs. per

head per diem, or 1½ lbs. of rice, but taking the former figure this means 14,500 tons per annum. Native grown grain is of course largely used, but unfortunately foreign rice has in the past been required to supplement local deficiencies, and the same may be the case again if, from any cause, lack of supply, exportation, or augmentation of labour on the mines, the local product cannot satisfy the demand. It would be of interest to know how much of the different cereals consumed are respectively grown by European farmers and by natives in Rhodesia, and how much imported from the South, from Portuguese East Africa, and from India. At a round price of only 10s. per bag this represents over £7,000. Meat, at one pound per week, means over one and three quarter million pounds weight per annum, of which it is notorious that the most has hitherto come in as beef from the North and as mutton from Cape Colony. In view of the demand for oxen for draught purposes and the lack of small stock, it must yet be some years ere we can hope to be self-supporting in this direction. But it is not to these products that attention is particularly called, but to the item "vegetables," of which two pounds per week is the statutory allowance, working out on the present basis at 3,563,664 lbs., or roughly 1,780 tons of vegetables annually. The Government Notice mentions "potatoes, beans or the like," and this term is understood to include pumpkins, sweet potatoes, monkey nuts (ground nuts), cabbage, onions, wild spinach, and all vegetables that travel and keep well. When this measure was introduced it was hailed as a boon to the farmers, affording a ready market for perishable produce and alternative crops for cultivation, always a great advantage in the economical working of a farm. To some extent this has been realised, but it must be admitted that there is still cause for dissatisfaction on both sides, the mines complaining bitterly of lack of supply, and the growers equally vehemently protesting their inability to dispose of what they have. The law of supply and demand will no doubt in time regulate trade in the usual way, but it seems to want some artificial stimulus to enable it to do so. At the time of writing potatoes and pumpkins are reported as drugs on the market, yet the former are stated on the best authority to enjoy "always a ready sale" and the latter was in great demand last season. So great was that demand that a good



Photo by] [Kincaid Smith

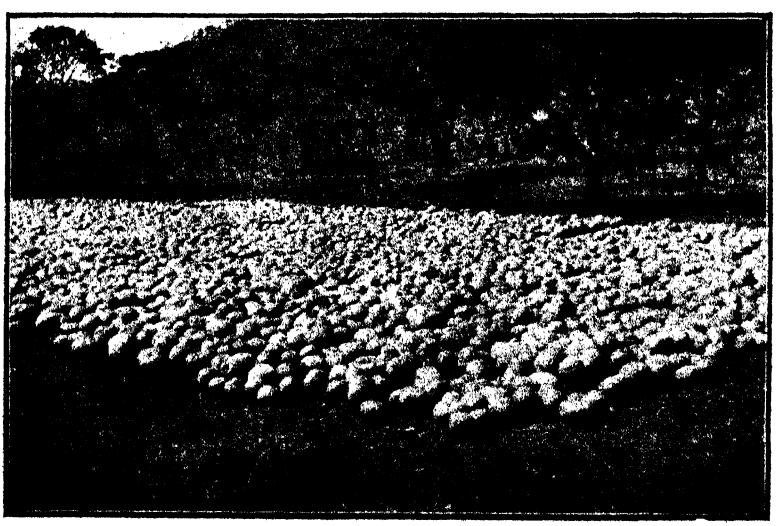


Photo by] [Eric A. Nobbs

Pumpkins in Southern Rhodesia

deal was picked not properly ripe and these did not keep, so this excellent vegetable is discredited. On the other hand, being in such request last year, many were induced to grow pumpkins extensively and can now find no outlet. At least one farmer we know is offering his pumpkins at one sovereign a buck-wagon load—say four or five tons—to anyone that will ride them from his farm, but without offers. Evidently here a little better knowledge on both sides would have prevented the prejudice arising last season and the glut this year. The accompanying illustrations indicate how readily pumpkins can be grown. There are farmers in a position to guarantee a supply of potatoes continuously from January to September, and who would willingly fulfil contracts to do this at 1½d. per lb. on the farm, and no doubt it would be to the advantage of the employers of labour to enter into fixed agreements covering such a period. A seasonal scarcity in the supply of one sort of vegetable or another is in the nature of things. A supply of one and the same kind of vegetable throughout the whole year is not possible nor desirable, and there is no occasion to insist upon it. Naturally green food such as cabbage or spinach is scarce during the latter portion of the dry season, and prices at that time must be correspondingly higher. Last year potatoes were scarce and in demand. This year they are not wanted, but onions are coming all the way from Egypt. It is admitted that onions are a difficult crop to grow and take considerable labour, but medicinally they are highly esteemed and have the great merits of keeping well and being readily transported.

The sweet potato is another vegetable eminently suitable to cultivation on a large scale and which might with advantage be grown much more generally than is at present the case. It yields well, keeps well and is nutritious and palatable; it is not difficult to grow, thrives on a variety of soils and responds generously to manuring. It is readily propagated from cuttings and there are several varities earlier and later, some yielding more heavily, some ripening more rapidly, so that a supply can be distributed over a prolonged period.

The ground nut or monkey nut enjoys a special advantage in being recognised as a vegetable and at the same

time as a substitute for the eight ounces of lard prescribed in regulation diet as to be furnished to each boy weekly. Hitherto this crop has not received the attention of farmers so much as it deserves, chiefly on account of the fact that implements to harvest and to clean it have not yet been introduced and hand labour has not been found economical. There is not the slightest doubt that large areas of this crop could be grown, particularly on our sandier soils, where the need of a change from mealies is more pressing and where the fertilising of this crop, which many people fail to recognise is a leguminous one, is of peculiar value. Whether ground nuts will ever be exported as is done so largely from the East Coast is a moot point, the local demand is the question deserving immediate attention. Ground nuts along with beans enjoy the merits of keeping well and of being portable in a pre-eminent degree.

Beans are very generally condemned as unprofitable, yet some men have made a great success of this crop and the prices are good. Too frequently beans are grown on newly broken up or on exhausted soil and the crop condemned for faults not its own.

Wild spinach frequently grows in the vicinity of the mines and is greedily sought after by the boys for its antiscorbutic properties, but it only comes with the rains and scurvy is apt to be prevalent during the dry months just before that time when green vegetables are specially desirable. For such purposes cabbages grown under irrigation would be very desirable but the labour and trouble of growing must be suitably rewarded and they may be regarded in this country rather as a market garden than as a field crop.

Yet another crop deserving attention in this connection and possessing the desirable keeping qualities as well as portability, is the cassava, manioc, which grows commonly in gardens or as hedges, but has not yet found a place as one of our routine crops. One advantage with this particular form of food is that it is one familiar to northern boys—quite a desideratum where rations are concerned. Neglected as this crop has in the past been there are no data to guide us

as to the cost of production and yield, and of course none as to market price.

To enable vegetable food of the descriptions mentioned to be sold at a reasonable and low price it is essential that they be grown on the field scale by the ton and by the acre, not in garden beds or patches. Many farmers find it advantageous to buy their vegetables from the coolie gardens, for this reason, that it would never pay to grow the small quantity one household requires. But if on land ploughed, not dug, on such a scale to allow of cheap production, but involving the investment of some little capital in the first instance, then the cost of production per pound might no doubt be materially lowered and the price correspondingly diminished. But to make such enterprise worth undertaking there must be some security of a market for the stuff when grown. On the other hand the mine management may reasonably look for a reliable, and above all things, a continuous supply before offering attractive terms. It is here that the main difficulty in the past seems to have been. In their eagerness to pay low prices during the season of plenty the consumer has discouraged the producer, with the result that periodically the cry is heard that vegetable food is unobtainable for the mines. Another factor is that the small market gardener can get rid of his surplus to the mines, thereby keeping up a, from his point, desirable shortage in the town market. He secures also a favourable outlet for his second quality, no doubt sound, good and wholesome and perfectly fit for human food, but less choice. Market gardening is a legitimate and deserving branch of the great agricultural industry but there are many parts of the country inaccessible to the market gardener, who must necessarily be near a town or close to lines of communication, and where the farms might well supply the local mines. It seems reasonable to assume that if the farmer could be assured of a sale at a fair price and the miner of a steady supply, the present difficulties might be overcome to the satisfaction of all parties. It is not easy for the individual farmer perhaps to make such an arrangement. Perhaps by combination through the medium of the farmers' association of a district or through a co-operative society, favourable arrangements might be made. In similar cases elsewhere the application of the co-operative principle has been very successfully applied.

Where the market is a very large one the difficulties under consideration tend to disappear naturally, but with us with comparatively small numbers and small quantities to deal with, there is less prospect of the matter righting itself unless action is taken by those directly concerned and the producers and consumers brought into touch. No doubt much of the present dissatisfaction could be dissipated by fuller knowledge of the conditions and requirements on both sides.

A vexed question is the price at which the class of produce can be profitably sold on the farm and yet kept at a figure within the reach of the consumer. Cost of transport will vary in every case so that the price may best be given as that on the farm and when the crop is grown on a field scale, not in gardens. The following figures are not claimed as original calculations but as opinions collected from a number of growers and are offered as reasonable average prices :—

Pumpkins, 1-5d. to ¼d. per lb. or 30s. to 40s. per ton.
Sweet Potatoes, 1d. per lb. or £8 per ton.
Potatoes, 1½d. per lb. or £12 10s. per ton.
Onions, 2d. per lb. or £16 per ton.
Beans, 2d. to 3d. per lb. or £16 to £24 per ton.
Ground Nuts, 1½d. to 2d. per lb. or £12 10s. to £16 per ton.

It would be of much interest and might lead to tangible results if those interested in the subject, both farmers and miners, would communicate with the Editor on this subject and we gladly throw our correspondence columns open for the purposes of a full discussion of this subject and will welcome any criticisms or suggestions that may be offered.

A Criticism of Rhodesian Maize.

By H. GODFREY MUNDY, Agriculturist and Botanist.

Until quite recently there appears to have been a general feeling among Rhodesian farmers that the quality of the maize grown throughout the country was fully equal, if not superior, to any produced elsewhere in South Africa, and perhaps even in the world.

It may at once be admitted that there was some ground for this belief, but unfortunately recent events have brought home to us that though much of the maize is of the first quality, yet the general average is seriously lowered by the high percentage of ill-formed and ill-nourished grains which are present in the bulk of commercial samples placed on local markets. It is a somewhat remarkable fact that local buyers and consumers have so far appeared content to accept any quality, no matter how poor, and to give the same price for it as for higher standards of grain, better grown and more carefully prepared for market. This being so it is not to be wondered at that growers have been lulled into a false feeling that their grain was sufficiently good to pass muster on any market, and to compete on equal grounds with maize grown in other countries.

Quite recently the Agricultural Department proposed a scheme for collecting representative samples of grain grown throughout the territory, with the object of arriving at a fair average quality standard for the whole of Rhodesia.

In some quarters this movement received a cordial support most gratifying to the Department, while in others the objection was raised that an export trade was not yet anticipated and therefore the necessity for this standardisation was not pressing.

The frailty of the argument became obvious when, owing to various causes, the Farmers' Co-operative Society decided at short notice, to export a trial shipment of about 10,000 bags. It was only then realised that far too little was known of the general quality of our maize, and difficulty was experienced in collecting this quantity of a sufficiently high

standard, to afford the European market a true estimate of what grade of maize might in future be expected from Rhodesia. Had this contingency been forseen, no doubt sufficient quantity suilably prepared for export might readily have been secured.

It is to be hoped that this object lesson will be taken to heart, and that in future farmers, merchants, and consumers will each and all combine to insist on the country producing that high quality of grain which favourable conditions of soil and climate make possible. Few are satisfied with the second best when the best is obtainable, and yet this is precisely the attitude which has so far existed in regard to maize.

There are two outstanding faults in the bulk of Rhodesian maize which the writer has so far handled, and when it is added that representative samples have been examined from upwards of forty thousand bags grown throughout Mashonaland and Matabeleland, it may be presumed that these defects are more or less universal throughout the country.

The first serious fault is lack of uniformity within the bag, while the second is the very indifferent manner in which the grain is prepared for market, and consequently the large amount of trash and rubbish which is present in the bags.

So far, very little commercial maize has been seen which would pass the high grade of choice for export, and indeed much of that now offered as seed maize is but little better than what we might reasonably expect to export as prime f.a.q. (fair average quality) maize.

Lack of uniformity is mainly due to the growing of unfixed strains such as Salisbury White, and cross-bred Salisbury White and Boone County, while much of the Hickory King now in favour is not a pure strain, but is crossed with some other variety. The result of this, is that a continual splitting up goes on each year and new combinations are formed, giving rise to cobs and grain of different size and types. The same bag will often contain perhaps 60 per cent. of kernels of the Hickory King type, 30 per cent. of kernels more or less resembling horse tooth, while the

remaining 10 per cent. will probably be composed of rusted or immature grains, fragments of core, trash and dust.

There are two methods of remedying this defect; one by obtaining pure seed to commence with; the other by fixing a desirable type and by rigorous selection of seed, throwing out each year all cobs which do not conform to this standard. It may be objected that such methods are beyond the reach of the ordinary farmer—we do not think so—but if they are, tnen here is an excellent opening for breeders of pedigree seed, and though the labour entailed in growing pedigree maize is considerable, yet the profits obtained on seed sold at 30 - to £2 a bag should provide sufficient inducement.

With regard to better cleaning of the crop before bagging, this lies in the power of every farmer, or if not of individuals, at least of small groups of farmers. A hand winnowing machine is not a costly implement, and will dress per diem fully as much, if not more grain than can be shelled in a day's work. If winnowers were used in conjunction with shellers, and if, as could easily be done, the grain were led from the one to the other, the cost would be but very little greater than with the primitive methods usually employed, while on the other hand the work would be thorough. Most winnowing machines can be fitted with riddles, and the use of these would further enable the crop to be roughly sorted into grades.

The writer believes that Southern Rhodesia may and should become a large maize exporting country, and with the special facilities which soil and climate afford for producing really good crops, Rhodesian maize should rank second to none on the world's market. The fact is emphasized that all that is needed to evolve this higher standard is, firstly, care in using fixed strains and in checking deterioration by annual selection of the seed, secondly by thorough use of winnowing machines and riddles in preparing the crop for market.

The time has arrived when farmers must decide whether they will be satisfied with the best or with the second best, and, being confident of the high standard which can be reached, we have no hesitation in saying, let it be the best, and let Rhodesian maize take that high place which has been claimed for it.

Bots in Equines.

By R. FERGUSON STIRLING, M.R.C.V.S.

This is a condition set up in equines due to the presence of he larval stage of the fly Gastrophilus equi in the stomach.

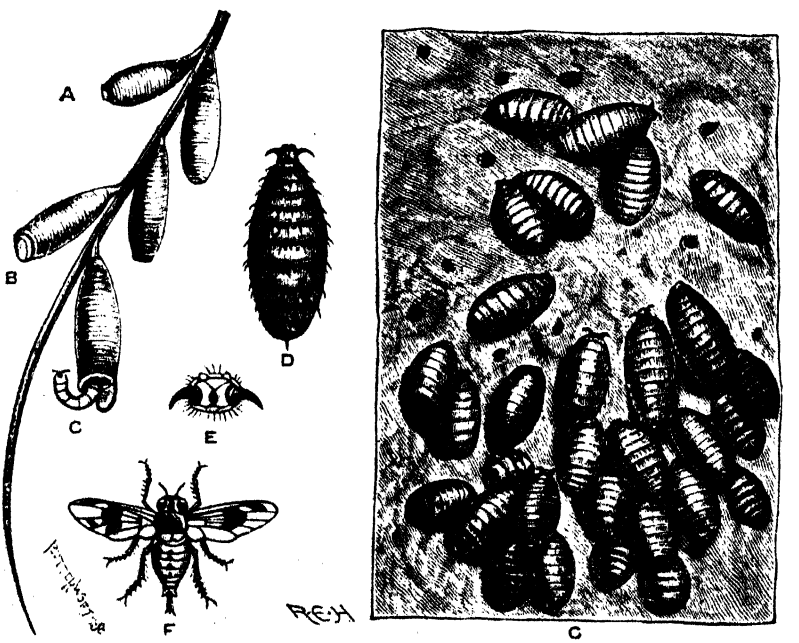
The mature fly is slightly larger than the ordinary blue-bottle fly. It is of a yellowish brown colour with dark spots. Its body is covered with fine downy hairs. It is not a stinging fly. During the months of July and August, and even earlier in some parts of Rhodesia, the fly is to been seen round horses, mules and donkeys, and it hovers there for the purpose of depositing its eggs. These are to be observed in various regions but the insect seems to have a preference for the fore quarters, upper portion of the legs and front of the shoulder. The eggs will be easily seen attached to the hair in these parts. They are of a bright yellow or yellowish white colour. They are firmly stuck to the hairs by means of a sticky substance which is exuded from the egg itself.

In four or five days after deposition the eggs are hatched and the little larvæ—these are the intermediate insect stages between the eggs and the mature flies—come out. These larvæ then begin to crawl over the skin of the animal on which they are present, causing irritation which impels him to lick at the place. In this way the larvæ are taken up, swallowed and pass into the stomach, where the majority fix themselves to the lining of that organ by means of hooks which are present on their heads. They screw their heads firmly into the lining or membrane of the stomach and live on material sucked from it. Their growth is very slow and it takes from ten to twelve months for these larvæ or bots to reach maturity. When they have reached maturity they detach themselves from the stomach and pass out from the body with the fæces. Then they either burrow into the ground or remain covered by the dung. Another month is passed in this manner and then at last the perfect fly comes out and begins another cycle of life by depositing its eggs, if it happens to be a female, on the legs of equines.

The symptoms of the presence of bots in the stomach are not very evident unless the parasites are present in large numbers. If numerous they set up the usual symptoms of colic, pawing the ground, looking round at the flanks, rolling,

etc. Occasionally they may cause death, but danger of this is apt to be greatly exaggerated.

On post-mortem examination the bots are found attached to the inside of the stomach wall. They are firm looking and possess eleven rings round the body and on each ring is a row of spines. In this connection I fear a mistake is constantly made by laymen. They open an animal's stomach and in it find a few bots. At the same time they notice that the stomach lining is of two colours, the one half being of a pink colour and the other half white. They then tell you that the animal died from bots and that they, the bots, had eaten half



the lining of the stomach away. Of course this is quite erroneous as the stomach of the horse always presents this appearance no matter what the cause of death may be.

Prevention, is by far the easier method of dealing with these parasites. It is done by simply removing the eggs from the hairs of the equines before they have time to hatch. The eggs as I have already stated are firmly attached to the hair, and the best method of removing them is by the use of singeing lamp or taper, or they can be removed by taking them off with a penknife. For ordinary purposes the cheapest and most common drench is a wine glassful of turpentine in a pint of linseed of oil for a full-grown horse. If this is not effective and the colic set up by these larvæ continues it is better, where possible, to obtain proffessional advice.

The "Nurseries Ordinance, 1909."

By RUPERT J. JACK, Government Entomologist.

This Ordinance was passed by the Legislative Council during the last session and has now been put in force by notice in the *Gazette*. This article is written with the object of explaining the provisions of the Ordinance and especially of enlisting the sympathy of the farming community and of nurserymen in the administration of the regulations. The object of the Ordinance as stated in the heading is to check the dissemination of pests and diseases from nurseries of plants and trees. Similar legislation is in force in all the Colonies of British South Africa, which have now thoroughly accepted the fact that it is due to the horticultural industry to ensure, as far as is practicable, that the young trees and distributed from the nurseries are free from pests. Through co-operation between the various governments legislation concerning nurseries in the British Colonies is practically uniform throughout South Africa a highly desirable state of affairs. The first to take steps towards controlling nursery traffic was Mr. Lounsbury, the Cape Entomologist, acting in unison with the Board of Horticulture in Cape Colony. The latter body drafted the "Nurseries Inspection and Quarantine Bill" in 1896, but it was not made law until 1905. The measure met with a good deal of opposition, not only from nurserymen, but also from a portion of the farming community, and was finally passed by the sheer weight of the Government majority. Now, however, it has apparently been realised by all that, instead of being a burden, the Act merely favours the careful nurseryman at the expense of the careless, and at the same time protects the fruit-grower from the results of the nurseryman's lack of care, or ignorance.

The Ordinance acts primarily for the benefit of the fruit-grower, and, to a lesser extent, of anyone who plants trees of any sort. The fruit-grower, however, is by far the heaviest sufferer from the class of pests that are likely to be distributed from nurseries, owing to the highly bred nature of his trees and their consequently reduced ability to withstand the attack of insect pests and diseases. Forest trees have more

resistance as a rule. Fruit-growing in Southern Rhodesia is as yet in its early infancy and the possibilities of the country to develop such an industry have not been gauged. There are, however, good indications that the culture of citrous fruit has a future before it, whatever may be the case in regard to other fruits. In any event it behoves us to give the man who puts fruit culture to the test the best chance of making his venture a success and the first necessity is that he should start with clean stock. Owing to the distance between farms in this country a farmer who plants trees free from pests is unlikely to receive infection with the class of pests that are more or less confined to fruit trees, and not gifted with means of voluntary locomotion over great distances, for some years.

Strange as it may sound, the Ordinance is really necessary in the interests of the Rhodesian nurseryman, as planters know that they can get clean stock from the neighbouring colonies, but have as yet no guarantee that such will be the case with that supplied from the local nurseries, hence the importation of such stock has in the past been comparatively large.

It may be in place here to say a few words concerning the nature of the pests that are most likely to be distributed with young stock. The majority of the very destructive pests with which the fruit-grower in South Africa has to contend have been introduced from oversea; in some instances with fruit, but mostly with nursery stock. A few names will illustrate the nature of the pests introduced through the latter agency. The most destructive of all is the well-known Red Scale (Aspidiotus auranti). Add to this the Soft Scale (Lecanium hesperidum), a bad pest of citrous trees in some parts, the Oleander Scale (A nerii), the Purple Scale (Mytilapsis citricola), which is very destructive to citrous trees in Natal, and many other scale insects, the Bryobia Mite (Bryobia pratensis), very bad in pear, prune, etc., in many parts of the Sub-continent, the Woolly Aphis (Schizoneura lanigera), and other aphides. It will be seen that these are pests which spend their lives more or less attached to their host plants and have no means of locomotion enabling them to travel great distances. Scale insects in fact are mostly spread through the agency of the wind, which carries the newly

hatched young to other trees, and the same may be said of the Bryobia mite, although as this pest is active all its life it may crawl some distance, especially as it has a wide choice in food plants. Aphides produce winged females at certain seasons which are capable of travelling to new plants, rarely any great distance away. These introduced pests are practically confined to cultivated plants and in many cases to fruit trees, and are usually unable to subsist on the natural flora of the country. Their great chance of being spread to new localities is through the agency of living plants. Unfortunately, owing to the lack of legislation in the past, most of them have already become very widely distributed and established throughout South Africa.

There is another great danger which the Ordinance under consideration aims at minimising. The Plant Import Regulations throughout the British Colonies and Southern Rhodesia are very stringent, but human methods are always fallible, and it is possible that, despite these regulations, one one or more of the dreaded pests that cause great loss to fruit-growers in other parts of the world, but do not, as far as is known, occur in South Africa, may be introduced. If so, the chances are in favour of the pest turning up in a nursery, as nurserymen are the chief importers of plants from ovessea. For aught we know to the contrary one or other of these pests may be already established in one of the Rhodesian nurseries. The nurseryman would in all probability be quite ignorant of the presence of this enemy for some years after its introduction, and continue to distribute his pestiferous stock to all parts of the country, when any methods of eradication would quickly become out of the question. Under a system of regular inspection such a possibility is avoided. Should it be considered unlikely that a nurseryman would be unaware of the presence of an unknown pest in his nurseries it is only necessary to state that many scale insects bear a very close resemblance to each other, sufficiently close even to deceive even experienced entomologists at times. Such an instance occured at Bloemfontein in 1907, when there was a scare concerning a supposed outbreak of San José Scale. It turned out afterwards that the scale was a native species, more closely allied to the San José Scale than any other known species, but this serves to illustrate how easily an inexperienced man

might be deceived in regard to a new pest and confuse it with a common species.

The Ordinance itself will now be considered in its different Sections.

An Ordinance to check the DISSEMINATION of PESTS and DISEASES from NURSERIES of PLANTS or TREES.

Be it enacted by the Administrator of Southern Rhodesia with the advice and consent of the Legislative Council thereof, as follows :—

1. For the purposes of this Ordinance the following terms within inverted commas shall, if not inconsistent with the context and subject matter, have the meanings hereby assigned to them, that is to say :—

"Nursery stock" shall mean trees or plants of any kind, not being vegetables, grown or cultivated for the purpose of trade, and with the intention of their being sold or distributed for the purpose of their being grown elsewhere than on the premises where they stand ;

"Nursery" shall mean any land or premises whereon is grown or cultivated any nursery stock, and includes any piece of land adjoining such land or premises and held by the same owner or occupier on which trees or plants are grown ;

"Nurseryman" shall mean the owner, occupier or other party responsible for the management of a nursery ;

"Pest" shall mean any injurious insect or other invertebrate animal or plant disease which the Administrator may from time to time, by notice in the *Gazette*, declare to be a pest within the meaning of this Ordinance ;

"Inspector" shall mean any person appointed by the Administrator for the purpose of carrying out the provisions of this Ordinance.

This consists merely of a definition of the terms used in the Ordinance and calls for little comment. It declares that any party who grows plants for sale or distribution comes under the designation of a nurseryman for the purposes of he Ordinance, even though the raising of plants may form but a small part of his business. Municipal Gardens and

Government Forest Plantations are not exempt from the action of the Ordinance. It will also be noted that no insect or plant disease may be considered a pest within the meaning of the Ordinance until it has been declared as such by the Administrator by notice in the *Gazette*. This provision gives discretionary powers to the Administrator, enabling him to administer the regulations in such a way that they do not fall too hardly on the nurseryman, as they would do were every injurious insect or plant disease to be considered from the outset a pest within the meaning of the Ordinance.

> 2. Every nurseryman shall, on or before the 1st day of September in each year, register his nursery or nurseries at the office of the Director of Agriculture, and shall obtain a written acknowledgment of his registration as a proof that he has complied with this requirement.

All nurseries must be registered once a year. The first step necessary towards controlling the trade in nursery stock is for the inspector to have a means of knowing the names and addresses of all the nurserymen within his jurisdiction, and this is the sole object of this Section. There is no charge for registration; it is merely the recording of the nurseryman's name and place of business.

> 3. No person shall, without special authority from the Director of Agriculture or some person authorised by him to act on his behalf, sell or expose for sale, or transport or attempt to transport any nursery stock not grown in a registered nursery. It shall be no defence to plead that such plants are not diseased.

This is simply the complement of Section 2, and provides that no party may carry on the business of a nurseryman without having first registered his premises. It must be pointed out that the term "nursery stock" in this Section is modified by the words which follow so that its meaning is not limited to the terms of the definition in Section 1. It applies to any young trees or plants fit to be transported for the for the purpose of their being grown elsewhere, though they may not have been raised for sale. No person may transport such plants without special permission from the Director of Agriculture or someone authorised by him to carry out the provisions of the Ordinance, in this case the Entomologist. The discretionary power granted here is

given to avoid making the regulation too rigid. Under this clause a private party may obtain permission to send a parcel of young plants or trees to a friend, or a permit may be issued to suit certain special circumstances.

> 4. Every nursery shall be inspected at least once a year by an inspector; other inspections may be made if deemed necessary. On the completion of any inspection of a nursery, the inspector shall make a report to the Director of Agriculture and inform the nurseryman what pests, if any, he has observed, and what measures he recommends for the suppression and eradication of such. After such intimation, no person shall remove or cause to be removed from such nursery, any such plant or portion thereof which the inspector has designated as liable to carry pest or disease, without the written permission of the inspector. Whenever such permission is given, the inspector shall at once report the fact to the Director of Agriculture.

This Section is clear and needs little explanation. It provides for the inspection of every nursery each year by an Inspector, who will furnish the nurseryman with a report on the condition of his premises in respect to pests, and if necessary, advise him concerning methods of cleansing his stock. The second portion of the Section lays down the first measures of control to be put in force against plants in a nursery found to be infested with insects or diseases that have been declared as pests under the Ordinance. These measures apply not only to nursery stock but to any tree, bush or other plant within the confines of a nursery. The next Section is an elaboration of the second half of this.

> 5. It shall be the duty of the inspector to declare under quarantine such part of any nursery as lies within eight yards of any tree shrub or plant which he finds infested with any pest, or within twelve yards if such infested tree shrub or plant is over ten feet in height; and such area shall be deemed and held in quarantine accordingly.

There is by the provisions of this Section no option left to the Inspector concerning the declaration of quarantine. The discovery of any of the pests declared under the Ordinance on any tree, shrub or plant within a nursery obliges the Inspector to declare under quarantine all the ground that lies within a radius of eight yards of the tree, shrub or plant, if under ten feet in height, or within a radius of twelve yards if it be over that height. A tall tree is likely to disseminate

pests over a wider area than a smaller one, owing to its being more exposed to the wind and to the fact that any object, a young scale for instance, falling from the top of a tall tree at a certain angle will strike the gronnd a greater distance from the trunk than one falling at the same angle from a shorter tree. A tall tree commands more ground, so to speak.

> 6. A quaraniine declared under the preceding section shall remain in force until the inspector shall at a subsequent regular inspection, or at an authorised examination, find the trees shrubs or plants within such quarantined area free from pests, and shall have given his written certificate to that effect to the nurseryman. During the period of the quarantine no person shall remove or cause to be removed or allow the removal of any plant from the quarantined area except for the purpose of treating or destroying the same on some part of the nursery premises in accordance with instructions from the inspector, and any person contravening any of tne provisions of this section shall be liable to a fine not exceeding £25.

The duration of quarantine is here defined. It depends on very simple factors. A quarantined area remains under quarantine until the Inspector is satisfied that the plants included are free from pest, and shall have given the nurseryman a written certificate to that effect. Thus it lies with the nurseryman himself to bring about the release of his trees from quarantine by carrying out thorough cleansing operations. The inspector will mark the limits of the quarantined area by some convenient method, probably by attaching labels to the outermost plants contained in the area, and this will form a barrier from within which the nurseryman will be forbidden to remove any plant under penalty of a fine not exceeding £25, unless he decides to destroy certain of the quarantined plants instead of attempting to cleanse them, in which case he may apply to the Inspector for permission and carry out the destruction in accordance with his instructions. It must be noted that the Inspector has no power to grant permission for plants to be removed from quarantined areas for any other purpose than of destruction.

> 7. Any nurseryman may have quarantined parts of his nurseries examined by the inspector between the regular inspections, once free of charge and once or more later at his own expense, provided he certifies that a period of six weeks has elapsed since the last last application of a remedial treatment. An examination under

this section shall be made as soon as it can be arranged for by the Director of Agriculture after the receipt of the request for it together with the required certificate.

This is an important Section to the nurseryman, as it provides for special inspections of quarantined parts of his nurseries subsequent to his having carried out cleansing operations. Applications for such special inspections must be accompanied by a certificate to the effect that six weeks have elapsed since the last time remedial measures were applied. This period is fixed in order to give the destructive agent time to work and for the results of its action to become manifest. Some washes for scale, for instance, act practically entirely in the newly-hatched young and in an examination a week or so after the application of the remedy the Inspector would be unable to judge the result conclusively. At the end of six weeks, however, the dead scales will be dry and shrivelled, the living eggs will have hatched out, and if the application has been successful, the resulting young scale will have been destroyed. In the same way in the case of a fungus disease, the plant will show signs that the spread of the trouble has been arrested. One special inspection of quarantined plants will be given free of charge, but any subsequent inspection, before the next regular inspection, will be carried out at the expense of the nurseryman. This provision has been made for the protection of the Agricultural Department, as a careless nurseryman might otherwise cause the Department considerable annoyance by demanding repeated inspections, without carrying out cleansing operations thoroughly. The concluding paragraph constitutes a further protection to the Department, providing that no nurseryman can demand a special ipspection on any date when it may happen to be inconvenient on account of the Inspector being engaged on other official work, though the Department will of course always endeavour to avoid undue delay.

8. The inspector may destroy or order destruction of nursery stock, or other plants in a nursery, which he finds infested by any specially dangerous pest liable to be disseminated with nursery stock, whether such pest has been proclaimed or not under this Ordinance; and may take the same steps in regard to any plant within twelve yards of such infested plants; provided, however, that compensation be awarded for the condemned plants that he does not actually find to be infested.

It is possible that an insect pest or plant disease, either new to South Africa or known to be circumscribed in its distribution in the country, may, despite all precautions, put in an appearance in a nursery, whence the danger of its being distributed widely by means of nursery stock would be great. In this regard may be instanced the case of the Downy Mildew of the Grape (Plasmopara viticola) in Cape Colony. The Inspector is given authority to destroy any plants infested with such a pest without any compensation to the nurseryman, and for the sake of safety to destroy surrounding plants, which may be compared to "contacts" in the case of a contagious animal disease. Compensation will be awarded in respect to the latter plants.

> 9. In the event of any nurseryman not agreeing to the amount of compensation awarded under the foregoing section, the amount of such compensation shall be awarded by a Board constituted by the Administrator.

The nurseryman is protected from any injustice in connection with the destruction of "contacts," not actually infested with such a pest as is specified in Section 8. The nurseryman and Inspector would in most cases be able to agree as to the value of the plants destroyed.

> 10. Any inspector, together with any person under direction or order of such inspector, may enter upon any land and do thereon such acts, matters and things as are necessary and reasonably required for the carrying out of the provisions of this Ordinance and any person obstructing, resisting or interfering with any such officer, in the lawful execution of his duty, shall be deemed to be guilty of a contravention of this Ordinance.

An Inspector is empowered to carry out the work of inspection and other proceedings necessary for the administration of the Ordinance at any time he may wish, whether the nurseryman be present or not, and any person who may be left in charge is obliged to yield the Inspector access to the premises for the purpose of the execution of his duties on penalty of the prescribed fine.

> 11. (1) The Administrator may by Government Notice declare any invertebrate animal or any fungoid or bacterial disease or pathological condition of trees or plants to be a pest within the

meaning of this Ordinance, and may prescribe the means to be taken generally or in any particular instance for the eradication or preventing the spreading of such pests, and also may generally make, alter or revoke such rules and regulations for the purpose of carrying out the provisions of this Ordinance as may from time to time be deemed to be expedient, and may impose penalties for the contravention thereof not exceeding a fine of £25.

(2) The Administrator may further in like manner prescribe the duties of and define the powers and authorities of inspectors under this Ordinance.

The declaration of what constitutes a pest within the meaning of the Ordinance is here vested in the Administrator, together with full discretionary powers in regard to the framing and putting in force of fresh regulations to control the spread of plant pests, and to augment or curtail the powers of Inspectors under the Ordinance and otherwise to define their duties. Any such new regulations will, of course, be published by notice in the *Gazette*.

12, Every nurseryman shall be taken to warrant that all plants sold by him are free from pest, and should any plants sold by a nurseryman be found by the purchaser within three days of the receipt thereof by him to be infected with any pest, the purchaser may return the same to and at the expense of the nurserymen and shall be freed from any undertaking or liability to pay for the same, or may recover the purchase price if already paid.

Every nurseryman, unless his nursery is found on inspection to be absolutely free from insect pests, which is unlikely, will need to erect a fumigating chamber for the purpose of treating any trees or rose bushes he sends out with Hydrocyanic Acid Gas. The Inspector will furnish advice as to the construction of this chamber and as to the quantities and use of the chemicals needed. This will be the best guarantee that plants sent out are free from scale and superficial insect pests, though, of course, it will not effect a fungus disease.

13. Any person contravening the provisions of this Ordinance, or resisting or impeding any officer in the execution of his duty, or refusing to give assistance which he may be reasonably required to give, or neglecting to comply with the provisions of this Ordinance, or any regulations framed thereunder, shall be liable to a fine not exceeding £25.

14. This Ordinance may be cited for all purposes as the "Nurseries Ordinance, 1909," and shall come into force upon such date as the Administrator shall by notice in the *Gazette* declare.

This concludes the provisions of the Ordinance and it is only necessary to add that there is no intention of applying these restrictions in such a way as to render it impossible for any conscientious nurseryman to carry on his business, but from what little is known at present of the condition of some of the nurseries in Southern Rhodesia there will have to be a very considerable improvement in regard to the prevalence of injurious insects if no loss is to be sustained when certain pests have been proclaimed under the Ordinance. It may be stated that it is not the intention at present to proclaim any pests during the first year. The nurseries will be inspected and the nurserymen will be advised as to the best methods of eradicating or suppressing the various pests that are found. The wise nurseryman will get to work at once on these operations and so prepare his premises to receive a clean bill of health at the next inspection, when the occurrence of certain plant enemies may cause portions of his stock to be placed in quarantine and occasion him considerable annoyance and possible loss.

Special Railway Rates for the Benefit of the Farming Community.

(Compiled.)

RATES FOR FARM HANDS.

The Board of the Rhodesia Railways have agreed to grant a special fare of ¾d. per head per mile for the conveyance, 3rd class, of native farm hands from Vryburg to Bulawayo when in batches of not less than six and upon production of a certificate signed by a Civil Commissioner of the district in which the farmer resides, or by the Director of Agriculture.

The Cape Government Railway and the B. & M. Railway do not grant this concession.

RATES FOR AGRICULTURAL MACHINERY, PRODUCE, ETC.

When Carried at Owner's Risk.

NOTE.—Unless otherwise specified, these rates are subject to the usual minima; a smaller consignment than the minimum stipulated is carried at the ordinary rate, unless the resulting charge amounts to more than that for the minimum quantity at the special rate, in which case the latter will apply. Charges are reckoned at full rates, and the rebate applicable to each item deducted from the gross charge, the nett freight only being invoiced.

ARTICLE.	FROM.	TO.	RATE.
Agricultural implements and appliances, as per list shown below.	Any station on B. & M. R. & R. R.	Any station on B. & M. R. & R. R.	Half Third Class Rate.
* Agricultural produce of Rhodesia and the Mozambique Co.'s Territory, such as Forage, Hay, Grain of all kinds, including Kaffir Corn, Kaffin Beans, Mealies, &c. also Ground-nuts, M'youti, Onions, Potatoes, Pumpkins, & Tomatoes.	Any station on B. & M. R. & R. R. (Lomagundi Branch excepted.)	Any Rhodesia Railway Station south of Francistown.	¼d. per ton per mile plus 1s.8d. per ton terminals subject to a minimum rate of 12s. 0d. per ton. Station to Station. Minimum 15 tons.
Do.	do. do. (Lomagundi Branche xcepted.)	Beira ...	¼d. per ton per mile plus 2s.6d. per ton terminals. Station to Station. Minimum 15 tons.

* To secure the reduced rates applicable to agricultural produce, consignor is required to furnish a certificate on the form provided for the purpose declaring the district in which the produce was grown.

ARTICLE.	FROM.	TO.	RATE.
*Agricultural produce of Rhodesia and the Mozambique Co.'s Territory, etc., etc. (as previous page) ...	Traffic in either direction from any station to any station on the Broken Hill to Gwelo Section and Branches.		Fourth Class Rate. Station to Station. Minimum subject to "B" smalls.
Do.	Traffic in either direction between stations on the Gwelo to Salisbury Section		Half Third Class Rate. Station to Station. Minimum 1 ton.
Do.	Traffic going towards Salisbury (inclusive) from any station to any station on the Beira-Salisbury Line.		Half Third Class "Inwards" rate. Station to Station. Minimum 1 ton.
Do.	Traffic going towards Beira from any station to any station on Salisbury-Beira Line(Salisbury inclusive) ...		Half Third Class "Inwards" Rate. Station to Station. Minimum 100 lbs., but no less charge than 1s. 0d.
Do.	Do.	do.	Half Fourth Class "Inwards" Rate. Station to Station. Minimum 5 tons.
Do.	Traffic in either direction between Stations on Lomagundi Branch		Station to Station. Minimum rate 4s. 6d. per ton. By special or ordinary train, Half Third per 100 lbs. for small consignments. Grain, Lomagundi to Salisbury Distributing Centre Rate, viz., One Fourth Third Class, minimum 4s. 6d. per ton. Where minimum rate applies, minimum weight 1 ton; other cases 5 tons.
Bags or sacks to be nsed for carrying grain.	Any Station on B. & M. R. & R. R. ...	Any Station on B. & M. R. & R. R. ...	Third Class Rate, less 33⅓ per cent.
Do.	Cape Town ...	Bulawayo ...	6s. 10d. per 100 lbs.
Do.	Port Elizabeth	Do.	6s. 0d, per 100 lbs.
Do.	East London ...	Do.	6s. 3d. per 100 lbs.
Citrus Fruit (during present season)	Salisbury ...	Bulawayo ...	2s. 7½d. per 100 lbs. plus cartage, minimum 100 lbs.
Cotton Seed ...	Any Station on B. & M. R. & R. R. ...	Any Station on B. & M. R. & R. R. ...	Half Third Class Rate.
Cotton in bales for export ...	Do.	Beira ...	¾d. per ton per mile. Minimum 5 tons. ¾d. rate only applies present season.
Dipping tanks and material, including cement for construction of tanks when so declared ...	Any Station ... (Beira to Gwelo Line and Lomagundi Branch only.)	Any Station ...	Half Third Class Rate.

* To secure the reduced rates applicable to agricultural produce, consignor is required to furnish a certificate on the form provided for the purpose declaring the district in which the produce was grown.

ARTICLE.	FROM.	TO.	RATE.
Fencing material (*i.e.*, Fencing Wire Plain, Barbed or Netting, Wooden Fencing Poles, Standards, Droppers, Struts, Strainers, Staples, Fencing Hurdles, Straining Posts, and Fittings, Fencing Gates, plain or common, for use in connection with Farm Fencing	Any Station on B. & M. R. & R. R.	Any Station on B. & M. R. & R. R.	Half Third Class Rate. Minimum 1 ton.
Firewood and Mining Poles in full truck loads; carriage calculated on the registered carrying capacity of the trucks	Stations on Gwelo-Broken Hill Lines and Branches	Stations on Gwelo-Broken Hill Lines and Branches	1 to 200 miles 1d. per ton per mile, and ½d. per ton per mile for the remaining distance. S. to S. Plus 1s. per ton terminal. In case of Firewood consigned to Bulawayo, carriage is calculated on three-fourths the marked carrying capacity of the truck.
Irrigation Plant and Machinery, such as Hand and Air Pumps, Tubes for lining Wells, etc., Windmills, to be used for Irrigation purposes, and so certified	Any Station on B. & M. R. & R. R.	Any Station on B. & M. R. & R. R.	Half Third Class Rate (on production of a certificate from the ultimate consignee on whose farm the appliances are to be used.)
Jute and similar Fibres	Any Station	Beira ...	1d. per ton per mile.
Manures and Fertilisers	Do. (Beira to Gwelo Line and Lomagundi Branch only.)	Any Station ...	Half Fourth Class Rate. Station to Station. Minimum 1 ton.
Do.	Any Station Beira - Gwelo Line	Stations beyond Gwelo	Half rates to Gwelo as above, plus ordinary rates onwards. Minimum 1 ton.
Do.	Beira ...	Bulawayo ...	£4 16s. 7d. per ton. Station to Station. Minimum 1 ton.
Do., imported in lots of not less than 1 ton or paying therefor	Cape Town ...	Do.	5s. 9d. per 100 lbs.
Do.	Port Elizabeth..	Do.	5s. 1d. „
Do.	East London ...	Do.	5s. 3d. „
Potatoes (Rhodesian grown) ...	Salisbury ...	Beira ...	£1 13s. 8d. per ton. Minimum 1 ton.
Potatoes (imported for *bona fide* planting purposes)	Any Station on B. & M. R. & R. R.	Any Station on B. & M. R. & R. R.	Half Third Class Rate.

ARTICLE.	FROM.	TO.	RATE.
Potatoes (imported for *bona fide* planting purposes	Cape Town ...	Bulawayo ...	7s. 2d. per 100 lbs.
Do.	Port Elizabeth..	Do.	6s. 4d. „
Do.	East London ...	Do.	6s. 7d. „
Timber (Redwood) for export	Forest Stations	Vryburg or Beira	½d. per ton per mile, full truck loads. S. to S.
Timber (Native) ...	Any Station on B. & M. R. & R. R.	Any Station on B. & M. R. & R. R.	1d. per ton per mile. S. to S., Minimum 10 tons
Tobacco (Rhodesian grown)	Do.	Any R. R. Station south of Francistown. From Vryburg onwards CGR rates apply. (Lomagundi Branch excepted.)	¼d. per ton per mile, plus 1s. 8d. per ton terminals, subject to a minimum rate of 12/- per ton. Minimum 5 tons.
Do.	Do.	Do.	½d. per ton per mile plus 1s. 8d. per ton terminals. Minimum 5 tons.
Do.	Do.	Do.	1d. per ton per mile subject to usual minimum.
Do.	Do. (Lomagundi Br	Beira ... anch execpted.)	¼d. per ton per mile plus 2s. 6d. per ton terminals. Minimum 5 tons.
Do.	Any Station ...	Any Station ...	Same as Agricultural Produce Rates but subject to ordinary "Smalls" minimum.
Do.	Do.	Salisbury or Bulawayo	When consigned to the B.S.A. Co.'s warehouse ¼d. per ton per mile. Minimum charge 1s.0d. per consignment.
Do.	Salisbury or Bulawayo	Any local Station	When consigned from the B.S.A. Co.'s warehouse, ¼d. per ton per mile. Minimum charge 1s. 0d. per consignment.
Do.	Salisbury ...	Bulawayo in local or thro' traffic	Do. do.
Vegetables (Market Garden Produce)	Consigned to Stations south of Vryburg.		½d. per ton per mile over the Rhodesia Railways throughout to Vryburg—minimum consignment 200 lbs.—1/8 per ton terminal.

The Railways reserve the right to grant or withdraw special rates for any traffic, under certain circumstances, without previous notice.

LIST OF AGRICULTURAL IMPLEMENTS AND APPLIANCES

Carried at *Half* Third Class Rates over Rhodesia Railways (all sections) and Beira and Mashonaland Railways.

Baling Presses.
Bark Cutters.
Baling Wire.
Binders.
Binding Twine.
Broadcast Sowing Machines.
Bone Mills.
Butter Churns.
Butter Tubs.
Butter Boxes.
Butter Workers.
Butter Driers.
Chaff Cutters.
Cheese Vats.
Cheese Presses and Pans.
Cream Separators.
Corn Drills.
Coolers, Milk.
Corn and Cob Grinders.
Cotton Baling Presses.
Cotton Gins.
Curd Mills.
Cultivators.
Dam Scrapers.
Dairy Utensils, except of glass.
Dip Baths.
Dipping Tanks.
Egg Boxes.
Fodder Shredders.
Grain Dressing Machines.
Grain Drills.
Hand Chaff Cutters.
Harrows (Drag, Disc and Pulverising).
Hay Rakes and Forks.
Hay Collectors.
Hay Presses (hand and power).
Hay Loaders.
Hay Tedders.
Headers.
Horse Gear.
Horse Hoes or Scarifiers.
Huskers.
Incubators and Foster Mothers.
Kaffir Hoes or Picks.
Kibbling Machines.
Land Rollers.
Maize Husking and Shelling Machines.
Manure Spreaders and Distributors.
Mattocks (for digging roots).
Mealie Binders.
Mealie Grinders.
Mealie Headers.
Milk Buckets and Cans.
Milk Warmers.
Milk Pumps and Elevators.
Mowers.
Oil Cake Breakers.
Pasteurisers.
Planters for all kinds of seeds.
Ploughs, all descriptions and spare parts.
Potato Diggers and Forks.
Railway Milk Cans.
Rakes.
Reapers.
Root Cutters.
Scythes and Sickles.
Scarifiers.
Shackles.
Shredders.
Shellers.
Sheep Shearing Machines and Sheep Shears.
Spraying Materials.
Spraying Pumps and Syringes.
Straw and Wind Stackers.
Straw Trussers.
Sterilisers.
Threshing Machines.
Tobacco Planters.
Trek Gear, Yokes, etc.
Weeders.
Winnowing Machines.
Wire (baling).
Wheat Strippers.
Wheat Harvesters.
Yokes.

TEMPORARY SPECIAL RATE FOR GRAIN AND MEAL CONVEYED TO DISTRIBUTING CENTRES.

Locally grown grain and meal in lots of 5 tons and upwards and other Agricultural Produce in lots of 1 ton or over, are conveyed, as a temporary measure, to the Distributing Centres of Umtali, Salisbury, Gwelo, Bulawayo and Livingstone at the following special rates:—

Beira-Gwelo Line, including the Lomagundi Branch	One-fourth 3rd class "Inwards" Rate.

NOTE.—In order to avoid fractions in the calculations, the rate per 100 lbs is multiplied by 5, which gives the correct rate per ton.

Gwelo-Broken Hill Line, including the Selukwe and West Nicholson Branches	One-half 4th class Rate.

The primary of this rate is to assist farmers in finding a ready market in the nearest towns of importance, and not for the purpose of competing in towns further removed from their respective Districts. The rate can therefore be applied only to the nearest appointed "Distributing Centre" on either side of the outlying Station or Siding at which the produce is railed. It must also be understood that the rate is "Station to Station," *i.e.*, exclusive of handling and cartage by the Railways (except by special arrangement), and does not apply from one "Distributing Centre" to another.

EXPORT OF MAIZE OVERSEA.

BEYOND SOUTH AFRICA.

THE FOLLOWING ARRANGEMENTS ARE IN OPERATION FOR THE EXPORT OF MAIZE OVERSEA.

1. The Railway Administration undertakes, subject to the following conditions, to receive consignments of maize (mealies) at any Station or Siding on the Main or Branch Lines between Beira and Bulawayo (inclusive),* dispose of same, on account of sender, in England, at market price on arrival, and remit the amount realised by the sale of the maize, less 2s. 6d. per bag to cover Rail Carriage, Shipping Charges, Wharfage, Customs Entries, Stamps, Ocean Freights, Commissions, and other charges incidental to the conveyance and disposal of the maize on the English market.

(*a*) The amount remitted to sender will be the price obtained on disposal, less 2s. 6d. per bag.

(*b*) The Administration does not undertake to land maize on the English market on any particular date, but the most expeditious transit reasonably and economically possible, will be arranged, and the maize will be disposed of in England as quickly as may be consistent with securing satisfactory prices at the rates ruling at the time.

(*c*) Senders desiring an advance on their shipments may have same arranged on application being made to the Railway Accountant, Umtali, or Stationmaster at point of despatch. The maximum amount advanced will be approximately one-half the current value

as ascertained from the latest market quotations; such advances will bear interest at the rate of 6 per cent. per annum. The balance due after sale of the maize, *i.e.*, amount realised, less 2s. 6d. per bag as above, less advance (if any) and interest, will be remitted to the Sender by the Railway Accountant or Stationmaster with as little delay as possible.

(*d*) The Administration will be responsible for ordinary risks, but against any special risks, such as heating, weevils, &c., consignors must insure themselves, if they desire to cover themselves against such risks.

(*e*) Maize will be sold on weight as ascertained and certified at port of shipment; but, if necessary, an allowance of 2 per cent. for sifting and drying out in transit thereafter is claimed, should it appear that such loss has occurred.

(*f*) The name or private code of the sender, together with the name or code mark of Station or Siding despatched from, as well as a letter indicating the Class of Maize, must be shown on the bags.

W will indicate White
FY " " Flat Yellow
RY " " Round Yellow } Maize.
M " " Mixed

E.G.—A bag of White Maize say from Jones, Bulawayo, would be marked ... 

(*g*) Consignor must perform loading at Sending Station.

GENERAL.

MINIMUM CONSIGNMENTS.—The minimum number of bags per consignment which will be accepted for export is 100 bags.

BAGS.—All bags must be new, double-sewn, and of 200 lbs. full weight nett. To ensure safe transit it is recommended that only 2½ lb. bags be used.

GRADING.—All maize for export will be graded at port of shipment. Each bag will be marked according to grade. Maize not coming up to standard will be marked "Below Grade." Maize which is not authorised by senders to be examined and marked by the Officer appointed for the purpose at port of shipment will not be allowed the benefit of the export rates, but will be subject to the ordinary Railway Tariff. Samples of the various grades will be available for examination at Stations. Samples may also be obtained from the Department of Agriculture, Salisbury, at a cost of 1s. per sample.

WEEVILS.—Maize found to be weevily before shipment will be immediately be sold on account of whom it may concern, and will on no account be shipped. Moreover, where weevils manifest themselves prior to grading, ordinary and not export rate will be levied.

*—The arrangements have been extended to include Nyamandhlovu and Plumtree.

IMPORTATION OF LIVE STOCK.

Live Stock imported for breeding purposes, or for *bona fide* work on a farm, are allowed a reduction of 50 per cent. over the lines from Vryburg or Beira, as the case may be. The Cape Government Railways allow a reduction of 25 per cent. on breeding stock sent over their lines to Rhodesia if belonging to and consigned to farmers. Under no circumstances will the concesssons be allowed over any of the Railways for Live Stock imported for slaughter or commercial transport. Application for certificates relating to the importation of Live Stock should be made to the Director of Agriculture, Salisbury, or to J. Woodin, Esq. (Examiner of Stock for Southern Rhodesia), P.O. Box 502, Port Elizabeth.

Poultry.

[CONTINUED.]

By PHILIP L. HALL, Lenham Farm, Syringa.

LEGHORNS AND ORPINGTONS.

A distinctive feature in the poultry section of the various shows held in Rhodesia throughout the past season was the addition in very good numbers of new varieties of fowls, that is varieties new to this country. Hitherto we have been used to seeing very large classes of Leghorns and Minorcas but comparatively few of the many utility breeds other than these. The Leghorn undoubtedly deserves its popularity as an egg producer owing to its hardiness and wonderful adaptability to circumstances. Its ability to get the bulk of its own living when allowed a good range and at the same time to return a full basket of eggs went a long way to establish it as a strong favourite among the farming community. As a general utility fowl the Leghorn cannot, however, compare with some other varieties. Owing to its small size it is all but useless as a table fowl, carrying no more flesh than the average native fowl. It is very probable that in the course of the next few years farmers will realise this deficiency in the Leghorn, and that the Orpington and Wyandotte will supplant it to a very great extent. The Orpington fowl is undoubtedly the leading general utility breed of the world to-day, having won its way by sheer merit into even the remotest parts of the world. The Black Orpington was the first of the several varieties produced by the late Mr. W.Cook some twenty years ago, and it has maintained a steady popularity ever since. As an exhibition fowl it has long been a great favourite with all classes of fanciers. The reason of this is not far to seek, for it is a very handsome bird and easy to prepare for exhibition, and no double mating is required, equally good birds of either sex being produced from the same pen. Mr. Cook used a cross between a Minorca cock and black sports from Plymouth Rocks, mating the progeny back to clean legged Lanshan cockrells. The result has been a short legged, deep bodied bird, with brilliant sheen and broad full front. The three main

characteristics to aim for in the breeding of Black Orpingtons are shortness of leg, colour, and last but most important of all, type. I will first speak of shortness of leg. Occasionally we see birds penned that almost touch the ground, so short are they, and, although we want short legged birds, this is overstretching the mark. Being full-bodied fowls, they must have a certain amount of daylight under them to show off the full effect of their body type. Birds that are as short in leg as I speak of seldom attain a great size, and size in the Orpington is essential. The colour should be black, with a beetle-green sheen, free from purple or bronze, and one of the chief aims in breeding is to get this colour not only on the top, but carried right down the breast into the fluff. At the present time there are very few birds that can show a really good colour throughout. In type they should have a broad full front, showing an unbroken curve from beak to tail. Many birds have a tendency towards being pinched in the breast, and one of the main objects of breeding is to get this perfect curve. The body should be deep through, as it is no use having a broad, full pouted bird if it has not the depth of body to set it off. The back should be short, with broad shoulders, with a saddle rising in a gentle sweep up to a neat flowing tail. The saddle itself should be broad, with a full hackle. The comb should be fine, evenly serrated, and free from side sprigs. It should be of medium size, set on a firm base; if too small it makes the cock look effeminate, but on the other hand a comb like the Minorca's tends to lessen the compact appearance of the bird. The colour of the eye has caused great controversy; many people talk of a jet black eye, although no one has ever yet seen it, and a dark brown iris with black centre is the best to be obtained and what the standard requires. Although it is necessary to only use one pen for the production of good specimens of both sexes, it is advisable to use care and discretion in the mating of that pen. Great size in the male bird is unnecessary, but perfect type should be looked for, and size considered in the female. Care to avoid very brilliant colouring in both sexes should be noted, as otherwise the progeny will be very liable to purple hairing or a bronze colour, which are both objectionable. There can be no question that this variety is an ideal fowl for the town dweller, where dark plumage is an advantage, and a very

quiet disposition, willing to submit itself to a restricted environment and yet remain vigorous and economical. It cannot be conceded that the Black Orpington is an ideal table fowl. The meat is too much on the thighs, and as it is slightly grey in skin colour instead of white. The flesh is abundant, however, and well flavoured, and for all round purposes can be strongly recommended. Probably the most popular variety of fowl is the Buff Orpington, in spite of the fact that it does not equal the White Leghorn or White Wyandotte as an egg producer, or the Dorking for its table qualities. Nor is it on the exhibition side that its reputation is wholly built. What then, may be asked, is the explanation? To which we may answer that it is the combination of qualities and its adaptability that account for the unique position of the variety. Practical poultry keepers all over the world have adopted it to a very large extent owing no doubt to the manner in which the agricultural authorities in many countries have advocated its discrimination as the breed specially suitable for the growing trade in eggs and chickens. The great secret is in the combination of white flesh and legs and tinted-shelled eggs met with in very few races. It has a great advantage over members of the same family in the distribution of the flesh. Light in bone, it does not carry so much muscle upon the thighs and the flesh is exceedingly well developed, white and cobby. Plumage colouration should be kept in the background by all utility breeders, and attention devoted to increased egg production and table qualities. The White Orpington has attracted a great deal of attention during the past few years. It has been a matter of conjecture as to how this variety was manufactured. Although still a much debated point as to who actually brought it out, I have every reason to support the claims of the late Mr. William Cook, who originated the Orpington fowl. He stated that he produced the white variety by mating Black Hamburg hens with White Leghorn cocks, and their offspring crossed with White Dorkings. Although the variety was produced in 1889, it was not brought prominently forward until the advent of the so-called Albion fowl ten years later. This variety was far more of the Orpington type than the original production. Hence after a few seasons the name Albion disappeared and the White Orpington came to the front. It is very firmly

established now, having a strong club to look after its interests in the Old Country, and it is a variety that can be bred by all with confidence, as it fulfills the real utility position, namely, excellent layers of large brown eggs and a very good table fowl indeed. The gentle habits of these birds and quiet business-like manner in which they work about for grubs and insects have established them as prime favourites wherever they have been kept. No prettier sight in the pultry world can be seen than a flock of White Orpingtons in a shady place and on short green grass.

Dates of Meetings of Farmers' Associations, 1909.

Name of Association.	Place of Meeting.	Secretary.	Oct.	Nov.	Dec.
Mashonaland	Salisbury ...	W. H. Williamson	2	6	4
Rhodesia Landowners' Farmers'	Bulawayo ...	Harry Hopkins..	30	28	30
Manica	Umtali	P. B. Snashall ...	2	6	4
Enkledoorn	Enkledoorn ...	A. J. Liebenberg.	30	27	25
Lomagundi	Eldorado Mine...	J. J. Reynard ...	9	13	11
Makoni	Rusapi	F. A. Lapham ...	...	...	15
Marandellas	Marandellas ...	A. J. H. Nicholson	2	...	4
Matopos	Matopos... ...	W. E. Dowsett...	...	...	5
Plumtree	Plumtree ...	J. Reid-Rowland.	...	7	...
Victoria (Eastern) ...	Good Hope Farm	F. A. Readman...	...	6	...
Victoria	Victoria... ...	James Rutherford	Uncertain.		
Midlands	Gwelo	Geo. Watkinson.		,,	
Figtree	Figtree	J. T. Kirschbaum		,,	
Melsetter	Melsetter ...	H. A. Oxenham..		,,	
Gazaland	Lower Melsetter	A. L. Sclater ...		,,	
Macheke	Macheke ...	J. Fountain ...		,,	
Hartley	Hartley	D. J. Kuntzen ...		,,	
Mazoe	Mazoe	F. Eyles		,,	

Reviews of Books.

SOUTH AFRICAN BEE-KEEPING.

By H. L. Attridge, F.R. Met. Soc., &c.

The text of this book first appeared as a series of articles in the Agricultural Journal of the Cape of Good Hope, to the Agricultural Department of which Mr. Attridge is adviser on agricultural matters. It is not the author's first contribution to bee-keeping in South Africa, as some years ago he published a short treatise on South African Bees, which met with a favourable reception. Many larger and more comprehensive works than the present volume, giving the experience of men in other countries, may be purchased at the booksellers, but our conditions are our own, and Mr. Attridge's experience has been gained in South Africa. We venture then to predict that this little book will be welcomed by devotees in this country of the fascinating industry of bee-keeping, whether for pleasure or profit. In perusing i's pages one cannot but be struck with the author's thorough grasp of his subject and feel that no advice is given which is not the result of practical test. The first chapters are devoted to a short history of the art, and we are favoured with a few remarks on the charms of bee-keeping as a hobby. The economy of the hive is then shortly outlined and the bee's position in the animal kingdom pointed out. After describing briefly the different races of bees the author proceeds to make the reader acquainted with the inmates of the hive, their life history and natural products. From this point to the end of the book the practical handling of the hive and its inhabitants, in order to obtain the best results in the shape of honey and other products useful to man, and the general management of the apiary, is dealt with in detail, and it is in this portion that the results of the author's valuable experience are most manifest. Bee enemies and diseases are dealt with in the two concluding chapters. As an appendix a short article on Bee-keeping in Natal, by Miss M. Ritchie, is added, together with a valuable contribution from the pen of Mr. Mally, Entomologist for the Eastern Province of Cape Colony, on Bee Pirates, which are very serious enemies to bees, at any rate in parts of Cape Colony. The whole book is excellently printed and copiously and

judiciously illustrated. It is neatly bound in cloth. The price is 2/6. A paper edition in the Dutch language is issued by the Department of Agriculture of Cape Colony.

R. W. J.

A RURAL READER FOR SOUTH AFRICA.

By Alexander B. Lamont, M.A., B.Sc. (Macmillan, 2 6.)

On the making of school books there is no end. But, amid the large variety of "Readers" which are struggling to obtain recognition in South Africa, it is safe to prophesy an immediate success for this one. As the preface tells us, the book is the outcome of a suggestion made in 1906 by Dr. Muir, Superintendent General of Education in the Cape Colony, to the Western Province Agricultural Society.

The range of contents of the Rural Reader for South Africa is very wide; indeed it may be said to cover the whole field of farming interests and occupations. Horses and cattle are treated with much fullness; dairying, sheep and ostrich farming, poultry and various crops, and fruit growing, all are well handled. Also there are separate chapters on special subjects such as locusts, irrigation, plant food, implements for tilling, tobacco and tree pruning.

The language is simple and free from purely technical terms, yet the method is scientific throughout; and every care has been taken to make the information accurate and up-to-date. Moreover, the manner in which the different subjects are dealt with is always interesting, and the illustrations are numerous, well produced, and instructive.

It is generally agreed that South Africa is fitted by nature to be an agricultural rather than a manufacturing country; the mineral industries of the sub-continent, enormously important as they are at present, will not improbably "have their day and cease to be." It is therefore excellent that interest in agricultural matters should be aroused in the minds of all South African children. Towards the attainment of this end Mr. Lamont's book is likely to be a most valuable contribution.

L.M.F.

[We understand that this book has been adopted for instructional purposes by the Department of Education for Rhodesia.—ED., "R.A.J."]

Agricultural Reports.

JUNE AND JULY, 1909.

MATABELELAND.—Horned cattle continue to thrive and are healthy, the pasturage for this time of year being exceptionally good. Lions have been troublesome in the districts of Wankies, Gwanda, Tuli and Belingwe.

All native crops have now been harvested and the returns appear to be fully up to previous years, although not so plentiful as was at one time anticipated.

Many parts of the country have been ravaged by veld fires attributable as much to careless sportsmen and transport riders as to mouse-hunting natives. In districts where the natives have been called out at the instance of the farmers to assist in turning fire lines in a systematic manner a marked benefit can be observed, not only as the direct effect of the fire lines but also in that the natives are impressed with the importance attached to the protection of the veld.

Farm labour supplies appear adequate for the time of year when, however, less is doing than in the ploughing and reaping season.

Scab, restricted mainly to native flocks, has made its appearance as was to be expected at this time of year. The tentative application of remedial measures in the Mzingwane area is meeting with no sort of opposition and no doubt when the benefit accruing is realised, will be fully appreciated.

No locusts were observed during the months under report.

MASHONALAND.—Farm labour is adequate owing to the importation from the North without which the farming industry would have been in a very awkward predicament. The further additions now anticipated are likely to be entirely absorbed during the approaching planting season.

The crops now everywhere gathered are reported as excellent, while with the exception of a certain amount of scab the health and condition of livestock is good.

Flying locusts have made their appearance in several districts. Although in this stage they cannot be destroyed it is highly desirable that all movements seen should be reported to the Department of Agriculture, as these swarms are likely to lay eggs presently and voetgangers may be looked for after the first rains.

Amongst natives the mealie crop has not been so heavy partly owing to so much being taken green owing to lack of food at the time. Rice appears to be a steadily diminishing crop, while more attention than previously is being paid to monkey nuts, beans and sweet potatoes, for which a market is found direct by the native producer at the mines.

While natives in Matabeleland are taking to the use of ploughs increasingly the Mashonas show no desire in this direction nor in any way to improve their modes of cultivation.

Farm Labour.

The following are the arrangements under which all farm labour will be distributed by the Rhodesian Native Labour Bureau, with which all farmers interested should make themselves thoroughly acquainted. Large numbers of boys are expected to arrive from the North during October, and as the planting season is approaching, no one should delay in making application:—

> His Honour the Acting Administrator has approved of an arrangement made at a Conference recently held in Salisbury between representatives of the Administration, the Rhodesian Agricultural Union and the Rhodesian Native Labour Bureau. Under that arrangement all farm labour will be distributed by the Bureau and

all business in connection with the Nyasa and other farm labourers already in the country will be undertaken by the Bureau.

The rates of wages and periods of service are as follow :—

NYASALAND FARM LABOURFRS.—Twelve months' service at wages of 11/- per 30 days' work for six months, and 13/6 per month for balance of term of service.

NORTH-EASTERN RHODESIA FARM LABOURERS.—Twelve months' service at wages of 11/- per month for six months, and 13/6 per month for balance of term of service.

NORTH-WESTERN RHODESIA FARM LABOURERS.—Nine month's service (minimum) at wages of :—

Adults :—

10/- per month for first three months ;
12/6 „ for second three months ;
15/- „ for balance of term of service.

Young boys :—

5/- per month for first three months ;
7/6 „ for second three months ;
10/- „ for balance of term of service.

Other terms and conditions may be prescribed by the Administrations concerned.

Native quarters for all northern natives will be inspected and approved by Government before delivery of natives to farmers. This regulation has been made by Government in the interests of farmers, as well as in the interests of natives to ensure, as far as possible, the good health of the labourers and a certain and continuous supply of farm labour from the north for the future. Farmers will, therefore, specially note this most definite requirement and provide at once warm weather-proof huts, in number sufficient to accommodate all the labour required, without overcrowding.

The Cost to Farmers will be :—

NYASALAND LABOURERS.—Delivered to farmers at Salisbury, including cost of return journey to Nyasaland at end of period of twelve months' service, each labourer £1 10 0

NORTH-EASTERN RHODESIA LABOURERS.—Delivered to farmers at Hartley or

Salisbury, including cost of return journey at end of twelve months' service, each labourer £1 10 0

The cost of blanket and clothing issued will be recovered by the Bureau from deferred pay of Nyasaland and North-Eastern Rhodesia Natives.

NORTH-WESTERN RHODESIA LABOURERS.—Delivered to farmers at Bulawayo:—Ex Kalomo, including cost of return journey to N.W.R. at end of period of nine months' service, but not including cost of blanket and clothing, each labourer £1 13 6

Ex Livingstone, including cost of return journey to N.W.R. at end of period of nine months' service but not including cost of blanket and clothing, each labourer £1 10 0

The cost of blanket and clothing issued will be charged by the Bureau to the farmer in the case of labourers from N.W.R., but will be recovered by the farmer from the first months' wages.

Should the farmer wish natives delivered by rail or messenger in outside districts of Southern Rhodesia he must pay the extra cost.

A deposit of 10/- for each labourer applied for to be made with application, and the balance before delivery.

The charges as above may be paid to the Secretary, Rhodesian Native Labour Bureau, Bulawayo, or to the Agents at Salisbury, Hartley or Gwelo.

Mr. J. S. Loosley (Secretary of the Rhodesian Agricultural Union) has been appointed Agent for the Bureau at Salisbury, and offices have been opened at the corner of Manica Road and Second Street.

Farmers are requested, in filling up application forms, to state where delivery of natives is desired.

Epitome of Cattle Inspectors' Returns.

JULY, 1909.

BULAWAYO.

SCAB.—One Scab Inspector was appointed and despatched to an area where Scab was plentiful in Mzingwane District, with portable dipping tank, etc., for purpose of treating infected native flocks.

MARONDELLA.

AFRICAN COAST FEVER.—Fresh outbreaks: None.

Existing outbreaks: At No. 1 Temperature Camp six animals with suspcious temperatures were destroyed, and remainder—six head—moved to clean veldt. No cases of the disease occurred at Springvale or Mr. Finch's farm.

HARTLEY.

A few deaths reported from Trypanosomiasis.

MAZOE.

Five deaths from vegetable poisoning occurred on the farm Weltevreden.

GWELO and MANGWE.

One outbreak of Scab in each district.

SALISBURY, ENKELDOORN, VICTORIA, MELSETTER and SELUKWE.

No contagious disease.

UMTALI.

AFRICAN COAST FEVER.—Fresh outbreaks: None.
Existing outbreaks: No deaths.

HORSE SICKNESS.—Two horses and two mules died.

SCAB.—One outbreak.

The following animals were tested for Glanders upon entry at Bulawayo and all were found healthy :—

Horses	...	...	...	67
Mules	...	...	...	172
Donkeys	...	...	...	84
				323

AUGUST, 1909.

BULAWAYO.

No contagious disease reported except Scab. The Scab Inspector has dipped a large number of infected flocks in the Mzingwane area, but the results are not yet to hand.

The following animals were tested with Mallein on entry and found healthy:—

Horses	26
Mules	128
Donkeys	52
	206

SALISBURY.

No contagious disease.

The following animals were tested with Mallein on entry and found healthy:—

Horses	18
Mules	33
Donkeys	6
	47

Eleven heifers and one bull imported from East Friesland were tested with Tuberculin on arrival, two of the heifers reacted.

MARONDELLA.

AFRICAN COAST FEVER.—Fresh outbreaks: None.

Existing outbreaks: No deaths.

UMTALI.

SCAB.—Two outbreaks reported.

WIREWORM.—A severe outbreak occurred on a farm at

Old Umtali, the source of infection was attributed to some diseased sheep bronght from Penhalonga Valley.

The following animals were tested with Mallein on entry and found healthy :—

Horses	...	...	...	2
Mules	...	...	...	21

MELSETTER.

Mr. Jarvis, Government Veterinary Surgeon, made a lengthened tour in this district and reports that considerable mortality in small stock from Wireworm and Bacillary Nacrosis of the Lungs.

HARTLEY.

Trypanosomiasis in cattle caused several deaths. There is no evidence of disease other than that contracted in the known Tsetse Fly areas.

SELUKWE.

Several dogs died, but the symptoms described do not appear to be those of Rabies. The head of one animal was received here, but in a bad condition, and it is doubtful if the experimental inoculations will prove satisfactory.

LOMAGUNDI.

Several Northern cattle in quarantine at Sipolilo died from Trypanosomiasis.

Small stock in the North-Eastern portion of the district have been dying to a considerable extent, but the cause of mortality is as yet unknown.

GWELO, MAZOE, CHARTER, VICTORIA, MAKONI and DARWIN.

No contagious disease reported.

J. M. SINCLAIR,
Chief Veterinary Surgeon.

Correspondence.

FARM TELEPHONES.

TO THE EDITOR, "AGRICULTURAL JOURNAL."

Cape Town,

10th September, 1909.

Dear Sir,—At the Congress of our Union held at Kimberley in May last the following resolution was carried: "That the Executive Council approach the various Governments and endeavour to secure the establishment of a system of Farm Telephones."

We have already received replies from the Governments of the Cape Colony, Rhodesia and Natal, and are again writing to the Transvaal and O.R.C. for their opinion on this matter.

At a meeting of the Commercial Committee held on Wednesday it was decided that all correspondence on this matter received up to date should be forwarded to the Agricultural Journals of the five Colonies so that they can circulate the information obtained. I am therefore enclosing copies of all information received, which I shall be glad if you will kindly publish.

Yours faithfully,

(Sgd.) P. W. DAY,

General Secretary,
The South African National Union.

Pietermaritzburg,

20th July, 1909.

Sir,—With reference to your letter of the 2nd instant, on the subject of the establishment of a system of farm telephones, I have the honour to forward herewith, for the information of the Educational Committee of the S.A. National Union, a copy of a minute on the subject by the Postmaster General of this Colony, together with the documents therein referred to. I also enclose a copy of a

memorandum by the Postmaster General regarding the cost of erecting telephone lines in Natal.

(Sgd.) H. A. HIME,
Under Secretary for Agriculture.

MINUTE.

The connecting of farms by telephone with centres of population is a subject in which I am much interested and to which I have given time and attention, and I am prepared to undertake such works in any part of the colony provided a sufficient return to cover annual charges and interest is assured. I beg to forward herewith for your information a resume of proposals made to provide such connections at Rosetta and Nottingham Road, but although I have no doubt the rates quoted were lower than would be quoted by any other South African Adminisiration, the farmers concerned considered the amount quoted as too high, and the negotiations fell through. It is interesting to note that in the case of Rosetta the most distant connection is 6½ miles from the station and the occupant would be required to pay only £10 10s. per annum for the service. At Nottingham Road the most distant connection is 11 miles away, and the farmer would pay £13 per annum. In Pietermaritzburg a business connection only a few yards distant from the Exchange is not installed for less than £10, the charge increasing by at least £1 for each quarter of a mile after the first two miles. A person residing five miles from the Exchange and requiring a business connection with the Exchange would, therefore, be required to pay rent of at least £22 per annum, and the Natal telephone rates, I should point out, are the lowest in South Africa. In the Transvaal a good deal is being said about telephones for farmers, but there is very little difference between their new rates and ours, as they charge 10 per cent. on the cost of extension as a yearly rental, and their cost of construction must be more costly than ours. I fear that unless farmers can be given telephones for next to nothing they will not take them up.

(Sgd.) C. MAXWELL HIBBERD,
Postmaster General.

ROSETTA.—It was proposed to connect ten farms with each other and the railway station. The erection of 16½

miles of line was involved—of which 13 miles would have been an entirely new pole line. The work was estimated to cost £750, and it was proposed to charge a rental of £10 10s. per annum for each connection. The amount of £126 per annum includes a fee of £7 10s. payable to the Railway Department for clerks' services at the Station in attending to the subscribers' requirements. (This fee would ordinarily be £2 10s. for such services, but owing to the required connections being widely separated it was necessary to estimate for the erection of three lines and arrange for connection to be established at the Station as required.) The inclusive return per mile works out at £7 12s. 7d. The charge was regarded by the applicants as too high.

NOTTINGHAM ROAD.—In this case it was proposed to connect seven farms with the Station, the most distant being 11 miles away. The erection of a new pole line for the distance was involved, and an expenditure of approximately £650. Including a fee of £2 10s. for clerk's services at the Station, an inclusive charge of £91 per annum was quoted, or a return of £8 5s. 4d. per mile. The charge, amounting to £13 per connection, was regarded in this case also as too high.

MEMORANDUM.—The cheapest satisfactory line that could be erected costs £50 per mile, and to this has to be added cost of apparatus, say £52 a mile.

£52 at 10 per cent. equals a rental of £5 4s. a mile.

The Natal charge is £7 a mile on a new pole line, or 15 per cent. on cost, and for an extension where the pole already exists, the charge is £4 a mile.

The Auditor General is being consulted on the matter now to see if percentage could be safely reduced.

(Sgd.) C. MAXWELL HIBBERD,
Postmaster General.

Department of Agriculture,
Salisbury,
13th August, 1909.

Sir,—In reply to your letter of 2nd July forwarding resolution passed at the S.A. National Union Congress on the question

of farm telephones, I have the honour to inform you that I have laid the matter before the Postmaster General who states that his Department is prepared to assist farmers in the direction of telephonic communication at the cheapest possible rate consistently with business principles. There are various ways in which telephonic facilities can be obtained at cheap rates, i.e.—

(1) The Department is prepared to build lines on guarantee, by the persons interested, of a revenue per annum which is based on the capital cost of the line. The amount of the guarantee depends upon the length of the line and whether built of wood or iron poles.

(2) Lines can be rented at tariff shewn on the accompanying copy of Postal Notice (No. 18 of 1908) or a modification thereof in those cases where the renter is willing to deal with public telegrams as well as his own business over the wire.

(3) Lines may be erected and maintained privately on payment of a small annual way-leave, not exceeding 10/- per mile.

(4) Arrangements can be made for the Department to supply the apparatus, wire, etc., and for the parties interested to build and maintain the line at a nominal rent.

He adds that he is most desirous of seeing the telephone utilised in every possible way, as there cannot be a doubt that facilities for communication with the town centres give a sense of security in outlying districts which is a valuable factor in their development, in addition to the better and quicker opportunities afforded for transacting business of all kinds.

I am, yours faithfully,

ERIC A. NOBBS,
Director of Agriculture.

Treasury, Cape Town,
3rd August, 1909.

Sir,—With reference to your letter of the 2nd ultimo., forwarding copy of a resolution passed at the recent meeting of the Educational Committee of the S.A. National Union in regard to the establishment of a system of farm telephones, I am directed to inform you that the undoubted great benefits to be derived from an extension of the telephone service into the country districts so as to connect farmers and others with

their social and business centres and with one another, have always been recognised by the Post Office and reference to the subject has been made in the Annual Reports. There is no difficulty whatever in establishing farm telephone systems either for the use of a single homestead or to connect a number of farms on one line to the nearest village or railway station. The Department has already provided a number of lines for farmers, and it is always prepared to erect more to meet any set of practicable conditions that may be put before it.

The ordinary rental charges are £2 per annum for each telephone, and £4 per annum for each mile of line. These rates, which free the renter from expense of maintenance, apply only in towns at which a linesman is stationed and where existing poles can be used. In outlying places this basis would not be satisfactory and in the case of lengthy lines the charge would prove prohibitive. The Department, therefore, undertake to provide lines on the following terms:

(1) The farmer may erect and maintain the line himself at his own expense, merely paying a nominal licence fee in formal acknowledgment of the Government's monopoly. The Department, if desired, will furnish technical advice gratis and it will supervise the construction and carry out repairs on reimbursement of its expenses.

(2) The Department will erect the line at the farmer's expense and charge him the actual cost of subsequent maintenance, subject to the payment of the prescribed annual licence fee.

(3) The Department will erect the line at its own expense and rent it to the farmer under a 3, 5 or 10 years' agreement at an annual rate which covers all labour costs involved and interest and depreciation charges upon the cost of the line. At the end of the agreement period a substantial reduction is made, but throughout the whole time that the line is rented, the farmer is responsible for repairs, etc. These he may attend to himself, or the Department will undertake it at his expense.

(4) The Department will advise as to the best means of utilising fencing posts as supports for telephone purposes in any practicable case that may be submitted to it.

It will be seen that it is not sought to make any profit out of this class of service. Despite this, however, owing to the

high cost of construction, the annual charges are considered by many applicants to be more than the telephone would be worth to them.

Telephones cost from £4 to £5 each and the present cost per mile of a single wire on 20 ft. poles over open veld and soft ground within 20 miles of the railway may be taken as from £50 to £60. The line costs can of course be reduced if the farmer provides the unskilled labour needed, and a further saving can be effected if suitable wooden poles are procurable in the neighbourhood at a low figure.

It will of course be understood that the matter has been dealt with herein purely from a commercial point of view and that the Department has had to see that the revenue has been adequately protected against loss.

I have the honour to be, Sir,

Your obedient servant,

WM. A. COLLARD,
Assistant Treasurer.

In response to an enquiry by the Postmaster General for Rhodesia, the following details have been elicited of the intentions of the Government of the Transvaal with regard to telephones in rural districts:—

Exchanges have been opened at Pietersburg, Klerksdorp, Potchefstroom, Lydenburg, Zeerust, etc., but in the absence of substantial votes for the erection of efficient trunk lines, country centres have had only an imperfect, though still useful, connection with Pretoria and Johannesburg. A number of circuits run through the country, telegraph superimposed on telephones, with several call offices connected along each line; and telephone circuits, crossed every mile to prevent inductive disturbance, are also run on existing telegraph routes.

From the country centres a number of lines have been run out to farms, a metallic circuit being given in every instance to admit of switching through the local exchange to the trunk lines, conversation with Pretoria and Johannesburg being found to be most desired by the farmers, who use the lines mainly in connection with the disposal of produce.

Wires to the farms are carried as far as may be convenient on existing lines.

The system of charge which has been provisionally approved until experience has enabled a suitable regular tariff to be adopted is this. An exchange subscription of £7 10s. per annum is required (it is £10 on the Witwatersrand). It is usually found that altogether 10 per cent. of the actual cost of construction beyond the exchange radius falls to be added to the exchange subscription of £7 10s.; and there are cases in which subscriptions of £15 to £20 a year cover a service from farms three or four miles from country centres to the local exchanges, while the farmers may also be "put through" to any other exchange on the trunk lines at a charge which has been fixed at 3d. per 25 miles of line.

During the recent session of Parliament £250,000 was allocated for the wide extension of the system in the country. Of this sum about £140,000 is intended to provide nine main trunk lines, running in all directions from the centre. About £50,000 will provide for subsidiary but still important lines from these trunks, and the balance is for many more exchanges in country towns and for other lines which are less urgently required but which are necessary to bring all parts of the country within reasonable distance of telephonic communication.

The cheap trunk line rate of 3d. per 25 miles will no doubt induce many farmers to conduct business from their country towns direct with produce merchants, etc., in the large centres; and when the many new lines projected are all erected they must cross or be near to many hundreds of farms whose occupants will have to pay very little indeed for connection with an exchange, under the arrangement previously referred to. It may be added that any rental is reduced, if another farm is afterwards served by a line on a percentage of the cost of which the first rental was fixed.

SOILS.

A CORRESPONDENT WRITES:—

"I am at present considering two farms, one of very heavy close black soil, quite wet at say 2 feet from surface even now —August 15th—the other quite sandy, but with good possibilities of irrigation. Will you kindly advise me as to what

general crops suit these different soils, and which soil is the most promising?"

ANSWER.

As a general rule black turf soils of this country are extremely rich and crop heavily, but at the same time they are risky lands to work, and in a year of heavy rainfalls crops sown on such land often suffer severely or fail altogether owing to the ground becoming waterlogged. Sandy soils on the contrary are usually poor and hungry, and though easy to work require heavy dressings of manure to produce even moderately good crops of maize, potatoes, etc.

On the other hand good possibilities for irrigation enhance the value of a farm enormously, as long as the expense entailed in taking out the water is not too great. At the present price of wheat and oat forage, not to mention early potatoes when a more steady market is assured, very good returns indeed can be obtained from irrigated land.

Speaking generally when once land is in good condition and not too raw, black turf soil will grow heavy crops of maize and probably of potatoes and beans as well, but this is always supposing it is well drained or that the summer rainfall is not so heavy as to cause the land to become waterlogged. On the same soil there seems reasonable possibilities of growing winter cereal crops without irrigation, and good opportunities of laying down English grasses for winter pasturage.

Unless the sandy soil is moderately rich it is unlikely that profitable crops of maize could be grown without manure. Bean crops should do fairly well and pea nuts or ground nuts should prove profitable. It would be advisable to grow these leguminous crops in rotation with maize. With heavy dressings of manure good yields of main crop potatoes should be obtained, while the light leaf tobacco would probably prove an important crop.

Another point which must be considered when taking up a farm, is the area of land which can be ploughed and placed under crop. On some farms this is comparatively small, not exceeding 100 to 150 acres, and with the prospects of maize becoming a remunerative crop for export, it is necessary to closely consider this aspect of the case,

H.G.M.

Garden Calendar.

By N. L. KAYE-EDDIE.

THE FLOWER GARDEN.

November.—All seeds may now be planted. Annuals for January flowering should be sown, amongst which the following will be found to do excellently in this country: Balsam, Calliopsis, Centurias, Crysanthemum, Dianthus, Eschscholtzia, Marigold, Mignonette, Gallardia, Phlox, Nasturtium, Nigella, Verbena, and Zinnia. These are all hardy and may be sown in the open either in beds or in the position desired for flowering. Advantage should be seized after each shower of rain during this month to keep the soil well worked and loose.

December.—Seeds of every description may be sown. Tender annuals should be covered until strong enough, with a light covering of grass to shelter them from heavy showers. This is one of the busiest months of the year, as most plants will require attention, weeding, training, staking, cultivating, etc. Plants ready for transplanting should be done at the earliest opportunity. This is a favourite time for sowing creepers and climbers, and those growing should be attended to and fastened up as new growth forms. Dahlias begin to appear, and should be staked immediately large enough and the soil kept stirred an inch or so deep around them, but this should not be continued after flowering has advanced. Carnations should be tied up to keep the flowers from the ground; if planted in rows an excellent plan is to put a strip of wire netting slightly doubled up between them. This gives them a more tidy appearance. Should roses show signs of mildew they should be immediately dusted over with a little sulphur.

VEGETABLE GARDEN.

November and December.—All vegetable seeds may be sown during these months. Tomatoes and early peas and beans should be staked. The soil should be kept loose and free from weeds, which now get troublesome.

Sow Pumpkin, Mealies, Peas and Potatoes.

Editorial Notices.

The "Journal" is issued bi-monthly, and the subscription is 5s. per annum, payable in advance. All communications relating thereto should be addressed to the Director of Agriculturre, Agricultural Department, Salisbury, and if an answer is required in the pages of the "Journal," should reach this office not later than the 15th of the month preceding publication. Subscribers are requested to notify immediately the non-delivery of the "Journal."

We regret that owing to unavoidable circumstances our Weather Bureau Reports are omitted from this number.

TO ADVERTISERS.—Application for space in the "Rhodesian Agricultural Journal," from the February number onwards, should be addressed to the Director of Agriculture, Salisbury, from which date the rates will be as follows, per issue :—

Position.	Whole Page.	Half Page.	Quarter Page.
	£ s. d.	£ s. d.	£ s. d.
Inner Pages	2 0 0	1 5 0	0 15 0
Outer Cover (back) ...	4 0 0	—	—
Inner Covers (back and front) and page facing Contents	3 0 0	1 15 0	1 0 0

A discount of 10 per cent. will be allowed for standing or consecutive advertisements running through six issues. Remittances, and electros where desired, should accompany orders. The right is reserved to discontinue the insertion of standing or consecutive advertisements should payment beyond the second issue be delayed.

The right of approval of all advertisements by the Director of Agriculture is reserved and his decision as to the acceptance or rejection is final.

An additional charge may be made for advertisements printed in special time, equal to any additional charges made by the printers for setting up same.

Advertisements will be accepted from bona fide farmers wishing to effect sale, purchase or exchange of produce, live stock, or farm implements, at a minimum charge of 2s. 6d. per insertion of 20 words. Extra words will be charged for at the rate of 1s. for every 10 words.

Applications for Advertisement Rates for the December issue should be made to J. Kapnek, Sole Advertisement Contractor for "Rhodesian Agricultural Journal," P.O. Box 91, Salisbury, and Box 45, Bulawayo.

Market Reports.

In Europe the market for cereals has since last report declined with improved home harvest outlooks. The latest crop advices from America, Romania and Russia are unfavourable. This should have a tendency to raise prices but for the unfortunate fact that owing to the reported faulty condition of recent arrivals South African maize has experienced a drop and the price of round yellows is given in recent reports as 24/- to 24/6 per quarter c.i.f., but white flat fluctuates from 25/3 to 25/9 per quarter c.i.f., having fallen from 28/-. As the quarter weighs 480 lbs. this means a fall to 10/- from 11/8 per bag of 200 lbs. landed in England. It should be remembered

that the B. & M. & R. Railways undertakes not only ocean freight but includes railage on this side and railage concessions and charges at the other end for 2/6 per bag.

The following are the latest market quotations received :—

(1) Jas. Lawrence & Co. (Transvaal), Ltd.—

Barley, per 150 lbs. ...	10/0	13/6
Boer Meal, unsifted, per 200 lbs.	22/6	25/0
Boer Meal, sifted, per 200 lbs.	28/6	31/6
Bran, per 100 lbs. ...	7/6	7/10
Beans, per 200 lbs. ...	12/6	44/0
Chaff, per 100 lbs. ...	2/9	4/3
Eggs, per dozen	9½d	10½d
Salt, per 200 lbs.	6/0	6/9
Forage, per 100 lbs. ...	3/6	7/3
Wheat, good, per 200 lbs.	20/0	22/6
Rye, per 200 lbs.	16/6	18/6
Manna Hay	4/0	4/6
Kaffir Corn, White, per 200 lbs.	7/10	8/3
Kaffir Corn, Red, per 200 lbs.	8/3	9/0
Butter, per lb.	10d	1/4
Hay, per bale	4d	1/2
Mealies, (S.A.), White, per 200 lbs.	8/2	8/6
Mealies, (S.A.), Yellow, per 200 lbs.	8/4	8/8
Oats, inferior, per 150 lbs.	6/0	7/9
Oats, good, per 150 lbs....	8/6	11/6
Potatoes, per 150 lbs. ...	13/0	19/0
Onions, per 120 lbs. ...	9/6	12/6
Lucerne, per 100 lbs. ...	4/3	6/6
Slaughter Oxen, dressed, prime, per 100 lbs. ...	30/0	33/0
Sheep, per lb., dressed weight	4d	4½d
Pigs, live weight, per lb.	2½d	3½d
Turkeys, each	4/6	12/6
Fowls, each	1/10	3/3
Ducks, each	2/3	3/3
Geese, each	4/6	5/6
Pigeons, each	9d	1/0

(2) Jas. Lawrence & Co., Ltd. Kimberley.—

Bran, per bag 100 lbs ...	7/0	7/6
Barley, per bag 163 lbs ...	10/0	13/6
Beans, Sugar, bag 203 lbs	32/6	37/6
Beans, Kafir, 203 lbs ...	11/0	13/6
Chaff, Colonial, bale ...	6/6	9/6
Chaff, Colonial, pressed, 100 lbs	3/0	4/0
Forage, good, per 100 lbs	5/6	6/0
„ inferior, per 100 lbs	4/9	5/3
Kafir Corn, S.A., mixed	6/6	7/0
Kafir Corn, White ...	6/6	7/0
Boer Meal, Colonial, unsifted	28/0	29/0
Boer Meal, Colonial, sifted	30/6	32/6
Flour, Colonial, per bag 100 lbs	17/0	17/6
Yellow Mealies, Colonial, 203 lbs.	9/0	9/6
White Mealies, Colonial, hard, 203 lbs	9/0	9/6
White Mealie Meal, 183 lbs	10/0	10/6
Oats, per bag 150 lbs ...	10/0	11/0
Lucerne Hay, per 100 lbs	4/6	6/0
Onions, per bag 120 lbs...	8/0	11/6
Potatoes, per bag 163 lbs	13/0	17/6
Potatoes, local	15/0	20/0
Tobacco, good, per lb ...	4d	7d
Tobacco, inferior, per lb	1d	2d
Wheat, per bag 203 lbs ...	23/0	26/0
Butter, fresh, per lb ...	1/2	1/6
Butter, second quality ...	10d	1/0
Eggs, per dozen	7d	9d
Ducks, each	2/6	3/0
Fowls, each	1/6	2/3
Turkeys, each	4/0	10/0
Salt, per bag	3/0	4/0
Lime, per bag	2/6	3/6
Guavas, per box	1/6	6/0
Oranges, per 100... ...	2/0	5/6
Naartjees, per 100 ...	1/6	2/6
Pineapples, per dozen ...	1/6	2/6
Beans, green, per lot ...	6d	9d
Peas	6d	9d
Cabbages, per dozen ...	1/0	4/0
Pumpkins, per dozen ...	2/0	6/6
Cauliflowers, per dozen...	3/6	10/6
Biltong, per lb	9d	1/6

SLAUGHTER.

Oxen, good, prime, 600 lbs upwards	£6 10	£9
Cows, good, 450 lbs upwards	£4 10	£6
Calves, per lb dead weight		4d
Pigs, 100 lbs (clean), per lb live weight	3d	3¼d
Lambs, 30 lb	6 6	8 6
Hamels, 40 lb to 45 lb ...	8 0	12 0
Cape Sheep, good ...	10 0	12 6
Kapaters, good	10 0	12 6
Oxen, Trex	£5	£6 10
Riding Horses	£10	£25
Draught Horses	£10	£22 10
Mares	£8	£20

(3) Hubert Morisse & Co., Johannesburg.—

Barley, per 163 lbs ...	10 6	14 6
Bran, per 100 lbs, Colonial	7 5	7 8
Chaff, best, 100 lbs ...	2 9	4 6
Eggs, per doz, Colonial...	11d	1 0
Salt, per bag	5 9	6 3
Forage, Transvaal ...	6 9	7 6
„ Colonial, best. 100lbs	7 6	7 9
„ med. & inferior „	3 6	6 0
S. Meal, best fine... ...	29 6	31 6
Rye...	17 6	18 6
Wheat	20 0	24 0
Mealies, Hickory King Whites	8 8	9 0
Mealies, O.R.C. Whites...	8 4	8 6
Mealies, Yellow	9 0	9 3
Kafir Corn, per 203 lbs ...	8 9	9 3
Hay, Sweet, Transvaal...	9d	2 3
Lucerne, per 100 lbs ...	4 9	6 0
Manna	3 0	4 9
Transvaal Hay	4d	10d
Oats, per 153 lbs... ...	7 6	12 6
Potatoes, best, per 153 lbs	13 6	16 0
„ med. and inferior	11 0	13 0
Onions, Cape, 120 lbs ...	9 6	11 0
Turkeys, Cocks	7 6	14 6
Turkeys, Hens	5 0	6 6
Fowls	1 10	3 9
Ducks	2 9	3 9
Geese	5 3	5 9
Pigeons	1 3	1 6
Butter, O.R.C.	11d	1 3
Pumpkins, each	2d	4d
Beans, per 200 lbs, Sound	13 6	45 0

(4) Whitfield & Co., Salisbury.—

Cows, good milkers ...	£25	£40
Cows, Native	£8	£9
Heifers, Colonial		£6
Heifers, Native		£4
Trained Oxen, large ...	£12 10	£15
Trained Oxen, ordinary ...		£10
Mules, inoculated		£30
Mules, not inoculated ...	£22 10	£25
Horses	£25	£30
Donkeys, Colonial... ...	£7	£8
Donkeys, G.E. African ...		£6 10
Sheep, Colonial		£1 5

(5) Wightman & Co., Ltd., Salisbury.—

Mealies, per 200 lbs ...	10/0	11/0
Rapoko, per 200 lbs ...	9/6	10/6
Potatoes, per 150 lbs ...	18/6	20/0
Forage, per 100 lbs ...	10/0	11/6
Manna Forage, per 100 lbs	5/6	7/6
Onions, per lb		3d
Beans, per 200 lbs ...	18/0	20/0
Munga, per 200 lbs ...	12/0	13/0
Monkey Nuts, unshelled per 83 lbs		8/6
Monkey Nuts, shelled, per lb	1½d	1¾d
Pumpkins, per ton ...	40/0	70/0
Sweet Potatoes, per 150 lb	10/6	11/0
Kafir Corn		
Wheat		

Departmental Notices.

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, etc.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

CO-OPERATIVE EXPERIMENTS.

The Department of Agriculture has stocked the following seeds for distribution this season under the usual terms of Co-operative Experiments. Farmers anxious to test crops on a small scale before sowing more largely, are invited to send in their applications as soon as possible. The distribution is limited, and not more than three to five sorts can be sent to each applicant. The amount sent to any one farmer will depend on the number of applications received, but in any case, sufficient seed will be forthcoming to give the crops a fair trial.

Seed is issued f.o.r. Salisbury, but farmers are expected to pay railway carriage. When the Agricultural Parcels Post Regulations are applicable this means of forwarding will be used as being cheaper and more rapid. Under these terms the seed is issued, on condition that the farmer co-operating supplies at the end of the season a true report on the result of the experiment on forms supplied for that purpose.

Applications should be addressed to the Agriculturist, and as far as possible, will be dealt with in the order in which they are received. The seeds stocked are as follows :—

LEGUMINOUS CROPS FOR HAY, SILAGE, GREEN MANURE AND PASTURAGE.—Lucerne for irrigated or dry land, Sulla, Florida Beggar Weed, Egyptian Clover, Tares or Vetches, Lupines, Sanfoin, Cowgrass Clover, Cowpeas, Velvet Beans

MAIZE.—Iowa Silver Mine, Hickory Horse Tooth, Champion White Pearl, Yellow Hogan, Eureka Field Corn.

HAY AND WINTER PASTURE, GRASSES.—Tall Fescue, Burnet, Paspalum, Sheep's Parsley, Rescue Grass, Guinea Grass, Teff Grass.

MISCELLANEOUS SEEDS.—Rice (improved varieties), Pea Nuts or Monkey Nuts, Castor Oil, Linseed, Rape, Chicory.

SALE OF TREES.

The following is a list of seedling trees offered for sale at the Government Experiment Station at a price of 1d. each tree f.o.r. Salisbury. The trees are now ready for transplanting, but owing to this year's stock being somewhat limited, the Department cannot guarantee to meet all demands and application should therefore be made early. The Department will pack and despatch all consignments as carefully as possible, but cannot accept any further liability once these have left their hands. Orders for trees should in all cases be accompanied cheque or Post Office Order for the necessary amount, made payable to the Director of Agriculture.

Indian Red Cedar ...	Cedrela toona.
Silky Oak	Grevillea robusta.
Bastard Mahogany ...	Eucalyptus botryoides.
Lemon Scented Gum ...	„ citriodora.
Sugar Gum Tree ...	„ corynocalyx.
	„ creba.
Woolly Butt Gum ...	„ longifolia.
Black Butt or Flintwood	„ pilularis.
Red Box Tree	„ polyanthema.
Red Mahogany ...	„ resinifera.
Red Gum	„ rostrata.
Saligna Gum	„ saligna.
Cypress	Cupressus guadaloupensis.
„	„ pyramidalis.
„	„ rostinea.
„	„ resistica.

	Callitris calcarata.
	„ rostrata.
Murray Cypress Pine ...	„ verrucosa.
Beefwood	Casuarina suberosa.
Canary Pine	Pinus canariensis.
Jerusalem Pine	„ halepensis.
Cluster Pine	„ pinaster.
Deodar cedar	Cedrus deodara.

NOTE.—The above Eucalypts are somewhat far advanced in growth and are therefore reommended particularly to persons living within easy access of Salisbury, since exposure lasting over several days, as would be the case on a long railway journey, might adversely affect their vitality.

SALE OF PASPALUM GRASS.

Slips of this valuable winter grass, for moist situations, are obtainable on application to the Director of Agriulture, Salisbury, packed in bags and f.o.r. Salisbury Station, at the rate of 5/- per 1,000. Good measure is given and remittance must accompany all orders.

MULBERRY CUTTINGS.

Mulberry Cuttings, f.o.r. Salisbury, 5/- per 100. Apply, Manager Experimental Nursery, Salisbury.

STRYCHNINE.

Stockowners can obtain a limited quantity of strychnine for the destruction of carnivora at a cost of 3/6 per ounce.

TOBACCO SEED.

All enquiries for tobacco seed should in future be addressed to The Manager, Rhodesia Tobacco Warehouse, at Salisbury or Bulawayo.

TOBACCO SEED BED COVERING.

A large supply of calico for covering tobacco seed is now available. It can be obtained from the Anglo African Trading Company at Salisbury, Bulawayo and Gwelo. Price 2½d. per square yard.

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seeds of any description are invited to communicate with the Government Agriculturalist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where the seed can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transactions.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem, leaves, flowers, and where possible fruit. Any particulars regarding the habits of the plant, the parts of it which are supposed to be poisonous, etc., will be welcomed, and in return the Department will supply all available information regarding the plants.

DESTRUCTION OF WILD CARNIVORA, ETC.

It is hereby notified for public information that the rewards for the destruction of wild carnivora, etc., will be paid only on the scale and conditions herein set forth.

2. Rewards will be paid as follows;—

For each Lion	...	...	£3 0 0
„ Leopard	...	...	1 0 0
„ Cheetah	...	...	1 0 0
„ Wild Dog	...	...	0 10 0
„ Crocodile, of not less than 3 ft. in length	...		0 10 0

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, and to natives by the Native Commissioner of the district, within three months of the date upon which the animal is killed, on a declaration made in the form of the annexure hereto.

4. In proof of destruction, applicants for rewards will be required to produce and surrender, in the case of the Lion, Leopard or Cheetah, the skin with the tail not severed, and in the case of the Crocodile or Wild Dog, the unskinned head.

5. The skins and heads of animals for which rewards have been paid shall be the property of the Government, and shall be disposed of in such manner as may be decided on.

GOVERNMENT STALLION FOR PUBLIC STUD.

The Stallion "Robber Knight" has been returned to Bulawayo, where his services for a limited number of mares will be available until further notice, free of charge.

Applications, giving full particulars of the mares to be served, should be addressed to the Veterinary Department, Bulawayo, where further particulars can be obtained.

The owners of mares brought to stud will have to make all necessary arrangements for attendance, stabling and feeding

of their animals, as the Department can take no responsibility whatever.

As the number of mares which can be served is very limited, the Veterinary Officer in charge is instructed to refuse service if any mare submitted is suffering from any hereditary disease, or is of an inferior type.

PEDIGREE.—"Robber Knight" by "Sir Hugo," ex "Fritters" by "St. Simon."

PURCHASE OF STUD STOCK BY GOVERNMENT ON BEHALF OF FARMERS.

The following particulars are published for general information:—

BASIS.

1. The scheme only deals with animals of pure breeds—British, foreign and South African—and preference will be given to farmers desiring pedigreed stock.

TERMS.

2. The Government will undertake the purchase of such stock for farmers on the conditions outlined below, and on the following terms of payment, viz.:—(1) a deposit on application; (2) one-third total cost on delivery, less amount of deposit; (3) one-third after six months, and (4) one-third after twelve months—both these instalments bearing interest at 6 per cent. or 10 per cent. if not paid at due date. For outstanding instalments promissory notes or surety will have to be given. These terms of credit will only be allowed on purchases up to a total maximum value of £75; sums exceeding that amount are payable in cash along with the first instalment. The Government reserve the right to refuse, without reason given, to accept applications or to fulfil purchases even after deposit has been made. All applications must be on the prescribed form "A," and all formalities complied with before same is registered. Applications will be considered in rotation, but fulfilled as opportunity serves,

so that animals may be procured as cheaply as possible. Thus small orders may have to wait till a complete truck load can be arranged. The buyer must undertake to accept the animal allotted to him, unless it fails to satisfy description as given in the application form. Disputes may be submitted to arbitration. The purchase price will include all expenses up to time of delivery, price paid to original owner, commission and charges of buyer and shipper, freight (including attendance and keep on journey), a charge per head for testing, expenses and keep during testing and inoculation up till time of delivery, and a departmental charge to meet administrative expenditure, but not insurance. The price referred to is that of delivery to applicant at the Government stock yards at Bulawayo or Salisbury. With every application a deposit will be made of £5 per head in the case of large stock and £1 per head in that of small stock, which will be deducted from the amount of the first instalment due. This deposit will be forfeited in the event of the application being withdrawn after having been registered. Stock are not to be disposed of without the written consent of the Controller of Stock until payment is completed.

Purchases will be made by the Department of Agriculture through its authorised representatives. Every effort will be made to secure animals in accordance with particulars furnished by applicants, and to the best advantage. All purchases must conform strictly to the importation regulations as regards age and freedom from contact with contagious disease. Pedigrees, if obtainable, will be supplied. All bulls are to be ringed. The Government will bear all risks of transport and inoculations and of death from any cause until delivery, all losses being chargeable to the vote. All animals failing to pass the necessary tests on arrival shall be destroyed and the loss borne by the Government, and another animal purchased for the applicant. It is not proposed to inoculate against redwater.

Prospective buyers will be advised of the probable cost. The Department will not undertake to purchase stock at precisely the prices specified by applicants, but will endeavour to approximate as nearly as possible to the figures given and not to exceed same by over 20 per cent.

The authorised representatives of the Government in South Africa will be allowed a reasonable commission, with expenses additional. Special terms will be arranged in the case of importations from abroad.

EXAMINATION AND INOCULATION.

On arrival at Bulawayo or Salisbury animals will be placed in charge of the Veterinary Department to tend and test. On completion of these processes the Veterinary Department will issue a certificate that the animal has recovered from the effects. The applicant or his agent will thereupon be advised to take delivery, which will be granted on payment of first instalment. After date of notification to applicant or his agent, responsibility will cease on part of Department and animals will be kept at owner's risk and a charge for keep levied—for bulls 2 -, heifers 1 -, small stock 6d., donkeys 1 -, and horses 4 - per diem.

At the request of applicant stock may be sent to him by the Department, but entirely at his risk and expense and only after receipt of first instalment.

FORM "A."

Purchase of Breeding Stock.—Application.

To the Controller of Stock,
Salisbury.

Sir,

I beg herewith to apply for the under-mentioned stock, to be purchased on my behalf on the conditions set forth on the schedule hereto, with which I declare myself conversant, and willing to be bound.

Enclosed find (cheque, draft, etc.) for £..... being deposit due. I agree to pay cash, when called upon, for all purchases (delete following if not applicable) in excess of £75, and for the remainder one-third in cash upon delivery of the said stock, less deposits as above, one-third six months thereafter, and one-third twelve months after delivery, together with interest at the rate of 6 per cent. per annum from the date of the said delivery, with each instalment as it falls due. Failing the payment of any instalment

on due date, the whole of the purchase money with interest thereon at the rate of 10 per cent. shall immediately become due and payable. Until the final instalment has been paid with interest as above. the ownership of the said stock shall not pass to the buyer, but shall remain the property of the B.S.A. Company, and shall not be disposed of except with the consent of the Controller of Stock in writing.

Witness my hand at.....this.....

day of.....19.....

Signature.....

Witness (1).....

Witness (2).....

I..... of.....

do hereby bind myself as surety for the due fulfilment of the above terms by.....

Signature

Witness (1).....

Witness (2).....

The stock applied for in the foregoing application comprises:—

Breed and sex.	Limits of purchase price, including all charges and delivery at Salisbury or Bulawayo. £ to £	Particulars (which will be complied with so far as may be in effecting the purchase).

.....

Signature of Applicant.

SCHEDULE TO FORM "A."

Conditions of Purchase of Breeding Stock from British South Africa Company.

The purchaser shall accept the animal or animals allotted to him, unless they fail to satisfy description as given by him in schedule to the application form.

The deposits at time of application are, for cattle and horses £5 each, for sheep, goats or pigs £1 each.

Payment of first instalment must precede delivery.

The Government will meet all losses up to the time notified to purchaser for delivery, after which they shall be entirely at purchaser's risk.

The Controller of Stock may refuse at any time to undertake or complete purchases without assigning reasons for so doing.

.....

Signature of Applicant.

EXPORTATION OF OSTRICHES AND OSTRICH EGGS TO GERMAN SOUTH-WEST AFRICA.

It is hereby notified for general information that whereas egislation has been enacted and promulgated, prohibiting the exportation of ostriches or ostrich eggs from German South-West Africa except to such South African States and Colonies as have enacted similar prohibitive legislation, the exportation of ostriches and ostrich eggs to German South-West Africa is *ipso facto* permitted.

ERIC A. NOBBS,

Director of Agriculture.

Department of Agriculture,
Salisbury, 9th September, 1909.

Government Notices.

No. 197 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 2nd September, 1909.

UNDER and by virtue of the powers vested in me by section 14 of the "Nurseries Ordinance, 1909," I do hereby declare that the said Ordinance shall come into operation upon the third day of September, 1909.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator.

P. D. L. FYNN,
For Treasurer.

No. 198 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 2nd September, 1909.

PROHIBITION OF IMPORTATIONS.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby amend Government Notice No. 295 of 1908, by including the following sub-section in section 1 thereof:—

(6) All animals and dogs from India.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,
For Treasurer.

No. 201 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 9th September, 1909.

IMPORTATION OF PLANTS REGULATION ORDINANCE, 1904.

IT is hereby notified, in terms of the Importation of Plants, etc., Regulations, published under Government Notice No. 141 of 1906, that I appoint Rupert Wellstood Jack, Esquire, to be an Inspector for the purpose of carrying out the aforesaid Regulations.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator.

P. D. L. FYNN,
For Treasurer.

No. 202 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 9th September, 1909.

NURSERIES ORDINANCE, 1909.

UNDER and by virtue of the powers vested in me by the "Nurseries Ordinance, 1909," I hereby appoint Rupert Wellstood Jack, Esquire, to be Inspector of Nurseries.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator.

P. D. L. FYNN,
For Treasurer.

No. 205 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 9th September, 1909.

ESTABLISHMENT OF A POUND AT NASHVILLE TOWNSHIP NEAR GWELO.

UNDER and by virtue of the powers vested in me by section 5 of the "Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Gwelo, the existing Pound at Gwelo has been abolished, and a Pound has been established on Stand No. 7, Nashville Township, near Gwelo, in the fiscal division of Gwelo, and that the said Pound shall be available for the public from the 15th day of September, 1909.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,
For Treasurer.

No. 211 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 16th September, 1909.

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseaess Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—

Grass	Straw
Hay	Lucerne Hay
Forage	Green Lucerne
Sugar Cane	

or any other bedding or fodder plant.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,
For Treasurer.

No. 216 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 23rd September, 1909.

MOVEMENT OF CATTLE, PROVINCE OF MASHONALAND AND DIVISION OF GWELO.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices No. 217 of 1907, Nos. 114 and 170 of 1908 and No. 199 of 1909, and so much of any other Regulation as may be repugnant to or inconsistent with the provisions of these Regulations, and declare that the following shall be of full force and effect in lieu, from date of publication, within the Province of Mashonaland and the Fiscal Division of Gwelo, as defined by the "Southern Rhodesia Boundary Regulations Amendment Regulations, 1898," which areas are hereby declared to be infected with a destructive disease:—

1. The movement of cattle within the said areas is prohibited save and except—

(*a*) on permission granted by an inspector or sub-inspector or other officer authorised by the Adminlstrator;

(*b*) within the boundaries of any single farm where such cattle are depastured;

(*c*) within any area enclosed by a substantial fence;

(*d*) within the boundaries of the various commonages, town lands or grazing ground common to any mining camp;

(*e*) for cattle the property of natives within a radius of four miles of their owners' kraal situate within the boundaries of any native location or reserve; the site of such kraal shall be deemed to be the place where it is situated at the date of publication hereof, and as is hereinafter further provided.

2. The movement of cattle for *bona fide* farming, breeding, mining, dairying, grazing and slaughter purposes may be permitted under the written authority of an official thereto duly authorised, subject to the following terms and conditions—

(*a*) the written permission of owners, occupiers or managers of all occupied lands, and, in the case of native reserves, of the Native Commissioner of the district over which cattle shall pass, is obtained; provided that, in the event of such owners, occupiers, managers or Native Commisssoners refusing to grant such permission, the Controller of Stock may direct the issue of a permit of removal if satisfied that the necessary permission is withheld without good and sufficient cause; and provided further that such permission shall not be required in respect of any movement of cattle within native districts or group of native districts as defined under Section 3 hereof, or in such districts or group of districts as may hereafter be defined, or in respect of movements authorised in terms of subsection (*c*) of the said Section;

(*b*) that such cattle shall, before being moved, be thoroughly dipped or sprayed to the satisfaction of the officer issuing the permit, and, if intended for slaughter, shall where possible be branded, under the supervision of the officer issuing the permit, with the letters "V.D." on the near hind quarter;

(*c*) that cattle intended for slaughter shall, on arrival at destination, subject to the terms of clause (*d*) hereof, be immediately taken to

the prescribed quarantine area and there be quarantined and confined, and, where not branded in terms of clause (*b*) hereof, be similarly branded under the supervision of a duly authorised officer;

(*d*) that all cattle intended for slaughter brought to their destination and not dipped or sprayed in terms of clause (*b*) hereof, shall be immediately thoroughly dipped or sprayed;

(*e*) that all cattle admitted to the quarantine area shall be slaughtered within twenty-one days of admission, and only be permitted to leave the area for the purpose of being driven to the abattoir for slaughter; and all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found outside the said area, at large or in possession of any person may be destroyed under an order of the Chief Inspector or Controller of Stock;

(*f*) that intermediate depots, or concentration camps, for slaughter stock may be allowed at centres approved of by the Chief Inspector of Cattle, provided that no such camp shall be situated within a less radius than five miles of any commonage, town lands, or grazing ground common to any mining camp, railway station or siding.

3. The movement of working cattle may be permitted under the written authority of an official thereto duly authorised—

(*a*) within the borders of the following native districts:—Gwelo, Hartley, Lomagundi, Marandellas, Melsetter, Selukwe and Umtali;

(*b*) within the following groups of native districts:—

(1) Charter and Chilimanzi;

(2) Mtoko, Mrewa, Makoni and Inyanga;

(3) Goromonzi' Mazoe and Darwin;

(4) Chilimanzi, Victoria, Ndanga and Chibi;

(*c*) between the Makondo Copper Mine in the Ndanga district and Karombe's Kraal in the Umtali district along the west bank of the Sabi river;

Provided that all cattle working under this section should be thoroughly dipped or sprayed every fourteen days, and provided that movements will be permitted for such periods as the Controller of Stock may in his discretion and on the advice of the Chief Inspector deem expedient, and that such permission may at any time be withdrawn or withheld without notice.

4. All applications for the removal of cattle from one native district to another shall be submitted for the approval of the Cattle Inspectors of the districts to and through which movements are made. All permits granted under the provisions of these regulations shall specify the number and brands of cattle, route to be traversed and time to be allowed for each journey, and such other conditions as it may be deemed expedient to prescribe; and all such permits shall be in the possession of the person travelling with or in charge of the cattle. Any breach of such conditions shall be deemed a contravention of the regulations in terms of section 9 hereof.

5. All veld-fed animals within the limits of the various commonages or town lands, or other centres where there is a common grazing ground and upon which public dipping tanks have been established, shall be dipped therein at least once every fourteen days; provided that the Controller of Stock may, an the advice of the Chief Inspector, direct the temporary suspension of this regulation for such reasons as he may regard as sufficient.

6. The following charges shall be paid at the time of dipping by the owner of the cattle or other animals required to be dipped under these regulations in respect of any dipping done at the public dipping tank:—

For horned cattle, 6 months and over	3d.	per head.
For horses and mules	3d.	„
For calves (under 6 months) and donkeys ...	2d.	„
For small stock	½d.	„

with a minimum charge of 6d. for any number of animals not aggregating such fee nnder the above tariff.

7. Any permit granted may be summarily suspended by any Inspector or Sub-Inspector or member of a police force finding cattle travelling under the same to be infested with ticks, and such officer may detain such cattle until such time as the animals have been cleansed to his satisfaction.

Any dipping or spraying required to be done under these regulations shall be carried ont with an approved tick-destroying agent by the owner of the animals; provided that the Inspector or Sub-Inspector may at his discretion carry out such treatment at the entire cost of the owner of such animals.

The Controller of Stock may, on the advice of the Chief Inspector, direct the temporary suspension of dipping and spraying for such reasons as he may regard as sufficient.

8. Whenever the owner, occupier or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying or dipping or any other method permitted by these or any other regulations, the Cattle inspector may order such natives or others as have cattle on the same farm ta cleanse such cattle or any others before permitting them to enter or pass over such area, and the Native Commissioner of the district in which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle, at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

9. Any person contravening any of the provisions of these regulations shall, upon conviction, be liable, in respect of each offence, to the fines and punishment prescribed by the Ordinance; and, in the case where no special punishment is provided, to a fine not exceeding £20 or, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding three months unless the penalty is sooner paid.

F. J. NEWTON,

Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,

For Treasurer.

No. 295 of 1908.

Department of Agriculture,
Administrator's Office,
Salisbury, 1st October, 1908.

IMPORTATION OF STOCK.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 8, of the 19th day of January, 1905, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries enumerated is prohibited, owing to the existence or supposed existence of destructive diseases affecting the said animals in the said countries:—

(1) All animals from the Island of Mauritius.

(2) All animals from German South-West Africa and all animals except donkeys from German East Africa.

(3) Pigs from the colonies of the Cape of Good Hope, Transvaal and the Orange River Colony, the Bechuanaland Protectorate, the Tati Concession, and other countries in which swine fever exists, subject, however, to the exceptions contained in the proviso to this section.

(4) Dogs from the territories of North-Eastern and North-Western Rhodesia and Portuguese East Africa; provided, however, that dogs from countries from which importation is permitted may be introduced through the port of Beira and brought direct into this Territory.

(5) Sheep and goats from (a) the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingswilliamstown, Komgha, Peddie, Somerset East, Stockenstroom, Uitenhage, and Victoria East, in the Cape Colony; (b) the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterburg, and Zoutpansberg, in the Transvaal; (c) Swaziland; (d) Portuguese Territory; (e) places north of the Zambesi River.

Provided, however, that the Controller of Stock may at his discretion permit the importation of pigs under six months of age for breeding purposes from the places mentioned in sub-section (3), and sheep and goats from the places mentioned in sub-section (5) hereof, on production of a certificate of a duly authorised Government veterinary officer that such animals are free from disease, have not been in contact with diseased animals, and have not come from an area where destructive disease has existed for twelve months previously.

2. The importation of organic manures, except guano, is strictly prohibited, and the importation of bone meal and bones required for fertilising or feeding purposes will only be permitted when accompanied by the certificate of a responsible and competent person that they have been thoroughly disinfected by treatment by superheated steam or other approved method. Any such manures, bone meal or bones introduced into Southern Rhodesia contrary to this regulation shall be liable to immediate destruction.

3. The areas set out in Schedule "A," and such further areas as may be added to the said schedule, shall be used in connection with pasture lands of the places to which they relate for the quarantining of animals

suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever.

4. The appointment of the areas set out in Schedule "B" hereto for the depasturing and quarantining of animals for slaughter in connection with the places therein mentioned is confirmed.

5. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel and the period for which the permit shall be in force. In cases where it may appear necessary or desirable, the person to whom any such permit is issued may be required to cause the animals referred to therein to be dipped before being moved.

6. The introduction of sheep and goats against which no prohibition exists may be permitted by rail, subject to the following provisions:—

(1) Plumtree shall be regarded as the port of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto; provided, however, the Controller of Stock may allow the introduction of well-bred sheep or goats intended for sale or stud purposes without being previously dipped.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival; provided, however, that animals intended for immediate slaughter shall be exempt from dipping if marked with a distinctive brand on the back.

7. The introduction of sheep and goats against which no prohibition exists may be permitted by road, subject to the following provisions:—

(1) M'Lala Drift and Fort Tuli shall be regarded as ports of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival.

8. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Officer at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detrained at any intermediate station without the written authority of a Government Veterinary Surgeon.

9. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the police camp nearest to the place where such entry is made, and the officer in charge of such police camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

10. All horses, mules and donkeys upon entering Southern Rhodesia shall be tested with mallein, and the owner or person in charge of such animals shall, in all respects, carry out the lawful directions of the Inspector while such animals are being tested; provided that this regulation shall not apply to animals in transit by railway through Southern Rhodesia and which are not detrained en route.

11. The Inspector may direct the detention of any animal, and its isolation for the purposes of such examinations and tests as may be deemed expedient during which period of isolation or detention it shall

be maintained and tended at the expense of the owner. If in the case of any such animal a second injection of mallein, applied at an interval of not less than ten days, is followed by a reaction indicative of the existence of glanders, such animal shall be forthwith destroyed.

12. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border to and from Portuguese East Africa, may be allowed so to cross on such terms as to registration, branding, testing and other conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

13. All horses, mules and donkeys depastured on the town lands of Melsetter and Umtali or on any public outspan adjoining such lands, and within the following area known as the Penhalonga, Imbesa and Samba Valleys, as bounded by the Umtali Waterfall Range on the north, the divide following beacons 18, 24 and 27 on the east, the Christmas Pass Range on the south, and the Palmyran Range on the west, in the district of Umtali, shall be dipped every fourteen days, by or at the expense of the owner or person in charge of such animals, unless the local Veterinary Officer shall see fit to dispense with such dipping.

14. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings, fodder, excreta or other matter or thing which may be reasonably calculated to convey such infection.

15. Any person contravening the provisions of these regulations, or pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or be liable in respect of each offence to a penalty not exceeding twenty the instructions or directions given in terms of these regulations, shall heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

W. H. MILTON.
Administrator.

By command of His Honour the Administrator.

F. J. NEWTON,
Treasurer.

SCHEDULE "A."

Areas on or near pasture land used in connection with townships set apart for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever:—

1. For the township of Salisbury and its neighbourhood, the Government Farm Makabusi, as defined in Government Notice No. 13 of 1898, namely, about six miles from Salisbury on the Old Charter Road, and bounded on the north, north-east and west by the farm "Willowdale," and on the south and south-east by the Makabusi River.

2. For the township of Umtali, a triangular piece of land situate to the north-east of the township, being that portion of the farm "Birkley" which falls in British territory.

3. For the township of Melsetter, a piece of land included within those lines bounding the pasture lands laid out around the township, which are in common with the outspan in the west, Sawerombi on the north, and Westfield on the north-east, bounded further on the south

by a line drawn from the common beacon of Westfield and Lindley to the common beacon of Fairfield and outspan.

4. For the township of Enkeldoorn, a piece of land about 2¼ miles due west of the township and bounded as follows: From a point about 400 yards above the junction of a stream running south of Enkeldoorn township with streams running west from the Police Camp; thence along the first stream to the junction aforementioned; thence along a valley running due south from the said junction to a point about 700 yards distant; thence in a north-westerly direction to a point on the top of a rise about 1,200 yards distant; thence in a straight line to the first-mentioned point.

5. For the township of Victoria, a strip of land half-a-mile in width lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

6. For the township of Gwelo, a triangular piece of ground within the reserved lands around Gwelo. It is bounded south by the Watershed Block along its boundary running from its joint beacon with Kanuck westwards to another beacon 1,518 Cape roods distant, bounded north-westwards by a line about 1,350 roods in length to the Inoculation Station, and bounded north-eastwards by a line from the first mentioned beacon to the Inoculation Station, and about 1,400 roods in length. This piece of ground is called the Inoculation Camp.

7. For the township of Bulawayo that portion of the commonage bounded on the west and north by the Bulawayo-Mafeking and Gwelo railway lines, on the east by the road known as "Hillside Avenue," on the south to the limits of the commonage and Hillside, known as "Napier's Lease," approximately 4,750 acres in extent.

SCHEDULE "B."

Areas set apart for depasturing and quarantining of animals for slaughter:—

SALISBURY.—Description of the area.—A piece of land, 400 acres in extent, situated on the Makabusi River, below Maggio's plot, towards the southern boundary of the Salisbury commonage.

BULAWAYO.—Description of the area.—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi Road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres, more or less.

GWELO.—Description of the area.—Starting from a point where the Ingwenia Road crosses the railway, along this road past the sanitary stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the commonage beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins Main Street extension along this to the railway line, and down this to the starting point.

UMTALI.—Description of the area.—Starting from a point at the south-east corner of the farm "Devonshire" and south-west of "Waterfall," up the stream to where it is joined by the stream commonly known as Rifle-butt Spruit, and up this spruit to a point 300 feet below Paulington Bridge. Thence almost due north on the west of Penhalonga Road to the sanitary pits and from the sanitary pits to the Cemetery, thence due west to the "Devonshire" line and along this line south to south-west corner beacon of "Waterfall."

SELUKWE.—Description of the area.—A piece of fenced land, in extent about 300 acres, situated on the farm "Sebanga" and adjacent to the township of Selukwe.

PENHALONGA.—Description of the area.—A piece of land bounded as follows:—To the northward by a line starting from the south-east beacon of the hotel stand to the south-west and south-east beacons of Crawford's butchery. To the eastward from the south-east beacon of Crawford's butchery to the northern boundary of the Penhalonga Proprietary Mines' ground. To the southward along the northern boundary line of the Pennaionga Proprietary Mines' ground. To the westward from the north-west beacon of the Penhalonga Proprietary Mines' ground to the south-east beacon of the hotel stand.

VICTORIA.—Description of the area.—A strip of land, half-a-mile in width, lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

SCHEDULE "C."

I, ...

residing at

in the district of in the

.....Colony, do solemnly and sincerely declare that the animals enumerated below are free from any contagious disease, including scab, and have not been in contact with any infected animals within six months from date hereof, and that to the best of my knowledge and belief such animals in travelling to* Station will not come in contact with any animals amongst which scab or any other contagious disease has existed during that period; further, that such animals were thoroughly disinfected by dipping on..... and will enter Southern Rhodesia within ten days of having been dipped.

And I make this solemn declaration conscientiously believing the same to be true.

Declared to at on this day

of before me.

.....

Resident Magistrate, Government Veterinary Surgeon, Scab Inspector, or Police Officer of district from which animals are being sent.

Number and general description of animals being sent

.....

Owner's name and Address

.....

Place in Southern Rhodesia to which animals are being sent

.....

* Station within Colony of origin.

CERTIFICATE ISSUED UNDER PROVISIONS OF SECTION 1, GOVERNMENT NOTICE No. 295 OF 1908.

This is to certify that the animals enumerated below are, in my opinion, free from any destructive disease, including scab, and to the best of my knowledge and belief have not been in contact with any infected animals nor come from,or through, a locality where any such

disease is known to exist or has existed for twelve months from date hereof.

Date.....

Place.....

.....

Signature of Government Veterinary Surgeon.

Number and general description of animals.....Pigs, ...Sheep, ...Goats.

Place from which animals are to be sent.....

.....

Owner's Name and Address

.....

Place in Southern Rhodesia to which it is desired to send the animals

.....

No. 110 of 1908.

Department of Agriculture,

Administrator's Office,

Salisbury, 16th April, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

(1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.

(2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."

(3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.

(4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.

(5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcases thereof disposed of in such

manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.

(6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—

(1) Importation shall be through and direct from the Coast Ports of the Cape Colonies, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.

(2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.

4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcases, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.
GOVERNMENT NOTICE No. 110 OF 1908, SECTION 1 (2).

1. Applicant's Name and Address.....
2. Number and Class of cattle to be imported.....
3. Area or Farm and District where Cattle are at present located.....
.....
4. Area or Farm and District to which Cattle are to be moved.....
.....

Applicant's Signature.....

Date

Application

Permit No.

No. 60 of 1909.

Department of Agriculture
Administrator's Office,
Salisbury, 1st April, 1909.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal Government Notice No. 124 of 1908, and do hereby declare and make known that, notwithstanding anything to the contrary elsewhere provided, the importation of cattle for bona fide slaughter purposes may be permitted into the Umtali district from the adjoining Portuguese territory, under the following terms and conditions:—

(1) The importation and disposal of cattle, introduced in terms of these regulations, shall be under the absolute control and direction of the local Veterinary Surgeon or other duly appointed officer, and shall be regulated by the requirements of consumption.

(2) The importation shall be by rail only, and all cattle shall be detrucked at the slaughter enclosure and immediately confined therein.

(3) All cattle admitted to the slaughter area shall be immediately branded with the letters "V.D."

(4) All cattle admitted to the slaughter area shall be slaughtered within ten days of their admission, and under no pretext whatever shall cattle so admitted be permitted to leave the said area alive; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.

(5) No meat shall be removed from the said area without special permission unless it is entirely free from skin and ears.

(6) The hides of animals slaughtered in the said enclosure shall be immediately immersed in an approved insecticide for a period of not less than twelve hours, and shall not be removed from the said enclosure unless accompanied by a certificate signed by a Veterinary Surgeon that they have been satisfactorily disinfected and dried.

(7) Any person contravening the provisions of these regulations or the instructions or directions of the local Veterinary Surgeon or other duly authorised official, given in terms of these regulations, shall be liable, in respect of each offence, to a penalty not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, unless where more severe or heavier penalties have, by the aforesaid Ordinance, been expressly provided.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 87 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 28th April, 1909.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Annexure "B" referred to in sub-section (2) of section 1 of Government Notice No. 110 of 1908, and in place thereof do substitute the following which shall, from date of publication hereof, be the form required to accompany Annexure "A," also referred to in aforementioned sub-section, viz.:—

ANNEXURE "B."

I, ..., residing on the farm in, do solemnly and sincerely declare that the animals enumerated below have been in my possession since birth, and that lungsickness, pleuro-pneumonia or other contagious or infectious disease has not existed amongst any of my cattle nor on my farm, nor among any cattle with which these animals have been in contact within the last four years, and that these animals have never been exposed for sale in any public market or stock fair nor been in contact with strange cattle, and that to the best of my knowledge and belief such cattle in travelling to Station (i.e., Station where cattle are to be trucked) will not come into contact with any animals amongst which lungsickness or any other contagious or infectious disease has existed during that period.

And I make this solemn declaration conscientiously believing the same to be true.

Declared to at.....on this.....
day of.....before me.....
Resident Magistrate for the district of.....
Number of Animals,.....Bulls.....Heifers, Breed.....
Seller's Name and Address.....
Purchaser's Name
Place in Southern Rhodesia to which animals are being sent.....

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.
F. J. NEWTON,
Treasurer.

No. 268 of 1907.
Department of Agriculture,
The Treasury,
Salisbury, 26th December, 1907.

REMOVAL OF CATTLE FOR SALE.

NOTWITHSTANDING anything to the contrary contained in the Regulations published under Government Notices Nos. 188 of 1906 and 217 of 1907, I, under and by virtue of the powers conferred upon me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide as follows:—

1. The assembly of cattle for purposes of sale by auction or otherwise

may be permitted as such places and under such conditions as the Chief Inspector may from time to time prescribe.

2. The movement of cattle into the province of Mashonaland and the fiscal division of Gwelo from other places in Southern Rhodesia may be permitted under such conditions as the Chief Inspector may from time to time prescribe.

3. The granting of permits for the purposes of Sections 1 and 2 hereof and the nature of the conditions to be attached thereto shall be at the absolute discretion of the Chief Inspector.

4. Any person contravening the provisions of these Regulations or the conditions attached to permits issued thereunder shall be liable to a fine not exceeding £20, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 356 of 1908.

Department of Agriculture,

Administrator's Office,

November, 1908.

MOVEMENT OF CATTLE INTO MATABELELAND.

NOTWITHSTANDING anything to the contrary contained in the Regulations published under Government Notices Nos. 188 of 1906 and 217 of 1907, I, under and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide as follows:—

1. The movement of cattle from the Province of Mashonaland into the Province of Matabeleland and from the Fiscal Division of Gwelo into other parts of Matabeleland may be permitted under such conditions as the Chief Inspector may from time to time prescribe, provided, however, that such movement shall not be permitted in respect of cattle imported from the country to the North of the Zambesi River until they shall have first remained for a period of at least twelve months in the Province of Mashonaland or the Fiscal Division of Gwelo.

2. The granting of permits for the purposes hereof, and the nature of the conditions to be attached thereto, shall be at the absolute discretion of the Chief Inspector.

3. Any person contravening the provisions of these regulations, or the conditions attached to permits issued thereunder, shall be liable to a fine not exceeding £20, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months.

By command of His Honour the Administrator in Council.

No 89 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 11th March, 1909.

MOVEMENT OF CATTLE, PROVINCE OF MATABELELAND.

1. UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 188 of 1906 and 216 of 1907, and declare the following to be of full force and effect in lieu thereof within the province of Matabeleland, exclusive of the district of Gwelo, as described and defined by section 4 (c) of the Southern Rhodesian Boundary Regulations Amendment Regulations, 1898, which is hereby declared to be an area infected with a destructive disease, and is hereinafter called the said area.

2. The movement of all cattle within the said area is prohibited save and except

(a) on permission granted by the local Cattle Inspector;

(b) within the boundaries of any single farm where such cattle are depastured;

(c) within an area of land enclosed by a substantial fence;

(d) within a radius of four miles from any native kraal situate within the boundaries of any native location or reserve, and as hereinafter further provided.

3. The movement of cattle for slaughter, grazing, bona fide farming, mining or breeding purposes, or for private milk supplies, shall be permitted under the written authority of an official thereto duly authorised, subject to the following terms and conditions:—

(a) that the written permission of owners, occupiers, or managers of all occupied land, and in the case of native reserves, of the Native Commissioner of the district over which such cattle shall pass, is first obtained; provided that in the event of such owners, occupiers, managers or Native Commissioners refusing to grant permission, the Controller of Stock may direct the issue of a permit of removal, if satisfied that the necessary permission is withheld without good and sufficient cause;

(b) that such cattle shall, before being moved, be thoroughly disinfected by dipping or spraying, to the satisfaction of the officer issuing the permit, and at the expense of the owner of such stock, and, if intended for slaughter, shall where possible be branded, under the supervision of the officer issuing the permit, with the letters "V.D." on the near side of the neck;

(c) that cattle intended for slaughter, shall, on arrival at destination, subject to the terms of clause (d) hereof, be immediately taken to the prescribed quarantine area and there be quarantined and confined, and, where not branded in terms of clause (b) hereof, be similarly branded under the supervision of a duly authorised officer;

(d) that all cattle intended for slaughter brought to their destination and not disinfected by dipping or spraying, in terms of clause (b) hereof, shall be immediately taken to the public dipping station and there be thoroughly dipped or sprayed before being taken to the quarantine area;

(e) that all cattle admitted to the quarantine area shall be slaughtered within twenty-one days of the admission, and only be permitted to leave the area for the purpose of being driven to the abattoir for slaughter; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area, or in

possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.

4. The movement of working cattle may be permitted under the following conditions only:—

Within the said area from private farms, mines and trading stations to any centre of consumption, or to or from a railway station or siding, or to and from any other farm under the permit of a duly authorised officer, which permit shall fully set forth the route to be traversed; provided that no permit shall be issued until the person applying for the same shall produce the written consent of owners, occupiers or managers of occupied lands proposed to be traversed, and in the case of native reserves, of the Native Commissioners, and that such cattle, before being moved, be thoroughly disinfected by dipping or spraying at the expense of the owner, and to the satisfaction of the officer issuing the permit; provided, further, that in the event of such consent being unreasonably withheld, the Controller of Stock may direct the issue of a permit.

5. All applications for the removal of cattle from one native district to another shall be submitted for the approval of the Government Veterinary Surgeon at Bulawayo and the Cattle Inspector of the district to which the removal is to be made.

6. All permits granted under the provisions of this notice shall specify the number and brands of cattle, route to be traversed, and time allowed for each journey. Any breach of these or other conditions endorsed on the permit by the issuing officer shall be deemed a contravention of these Regulations, in terms of section 9 hereof.

7. All veld-fed animals within the limits of the various commonages or townlands, or other centres where there is a common grazing ground and upon which public dipping tanks have been established, shall be dipped therein at least once every fourteen days; provided that the Controller of Stock may, on the advice of the Veterinary Department, direct the temporary suspension of this Regulation, for such reasons as he may regard as sufficient.

8. The following charges shall be paid at the time of dipping by the owner of the cattle or other animals required to be dipped under these Regulations, in respect of any dipping done at a public dipping tank:—

For Cattle (over six months)	3d. per head.
,, Horses and Mules	3d. ,,
,, Calves (six months and under)	2d. ,,
,, Small Stock	½d. ,,

with a minimum charge of 6d. for any number of animals not aggregating such fee under tariff.

9. Any disinfecting by spraying required to be done under these Regulations shall be carried out with an approved insecticide by the owner of the animals so sprayed; provided that the Inspector may, at his discretion, carry out such disinfection, with the assistance of and at the entire cost of the owners of the animals sprayed, the cost of such disinfection being payable at the time of the spraying.

10. Any person contravening any of the provisions of these Regulations shall, upon conviction, be liable, in respect of each offence, to the fines and punishments prescribed by the Ordinance; and, in the cases where no special punishment is provided, to a fine not exceeding £20; or, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding three months, unless the penalty be sooner paid.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 101 of 1909.
Department of Agriculture,
Administrator's Office,
Salisury, 19th May, 1909.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the disease amongst live stock, due to the organism known as Trypanosoma Dimorphon, to be a destructive disease within the meaning of the said Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 102 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 19th May, 1909.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the native district of Hartley, as bounded and described in Government Notice No. 13 of 1899, to be an area infected with the disease amongst live stock due to the organism known as Trypanosoma Dimorphon, which disease has, by Government Notice No. 101 of 1909, been declared a destructive disease within the meaning of the said Ordinance.

And I do further declare and make known that until further notice no animal within the meaning of the Ordinance shall be permitted to be moved from within the said area to any place without the said area.

Provided, however, that animals in transit by rail, coming from beyond the limits of the said district, shall be allowed to pass through the district, if not removed from the trucks in which they are being conveyed within the limits of the said district.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON.
Treasurer.

No 45 of 1909.
Administrator's Office,
Salisbury, 13th March, 1909.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 156 and 228, of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the

first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcases of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. In the event of any outbreak of rabies occurring, all owners of dogs within fifteen miles of such outbreak, or such other area as may be fixed, shall, on notification by any of the above-mentioned officials, or by Government Notice in the "Gazette," at once place and keep their dogs in a safe enclosure, or chained up, for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash held by the person exercising them.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the

owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON.
Treasurer.

No. 249 of 1908.
The Treasury,
Salisbury, 27th August, 1908.

PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON.
Treasurer.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

(a) Birds and Small Buck.

(b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tasessibe, Waterbuck and Wildebeest.

(c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—
In Mashonaland:

Birds from 1st May to 30th September.
Small Buck from 1st May to 31st October.

In Matabeleland:
Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Secretary for Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Secretary for Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Veit in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 40 of 1909 withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1910, and transfers from Class "C" to Class "B" Eland, Koodoo, and Zebra so far as that area is concerned. This means that these species may be shot by Residents of Southern Rhodesia on a £5 licence, and by non-Residents on a £25 licence, in this area, at any time up to the 30th June, 1910, in addition to the game described in Class "B."

Game in Class "A" may be hunted in the close season ending 30th April, 1909, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Salisbury, Bulawayo, Umtali and Melsetter; within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the land owner.

No. 128 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 10th June, 1909.

GAME LAW CONSOLIDATION ORDINANCE, 1906.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby declare and make known that the area described in section 1 of Government Notice No. 40 of 1909 shall be extended and include the area bounded as follows:—

From the Railway bridge on the Umfuli River thence north-westwards along the Umfuli River to where it joins the Umniati River, thence south-wards along the Umniati River to where it joins the Umsweswe River, thence eastwards along the Umsweswe River up to the drift at the Lydia Mine, thence along the old road from Lydia Mine to Etna Mine and to Inez Mine, thence northwards along the road from Inez Mine to Hartley, thence in the direction of the Railway bridge to the starting point on the Umfuli River.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council..

P. D. L. FYNN,
For Treasurer.

No. 129 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 10th June, 1909.

UNDER and by virtue of the powers vested in me by sub-section (2) of section 4 of the "Game Law Consolidation Ordinance, 1906," I do hereby suspend the operation of sections 5 and 12 of the said Ordinance in regard to all game in Class "B" and the following game in Class "C," viz., eland, koodoo, zebra and Burchell's zebra or quagga, within the area described in section 1 of Government Notice No. 40 of 1909, as amended by Government Notice No. 128 of 1909.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council..

P. D. L. FYNN,
For Treasurer.

Ordinance No. 1, 1908.] [Promulgated 18th December, 1908.

SOUTHERN RHODESIA.

AN ORDINANCE TO FURTHER AMEND THE LAW WITH REFERENCE TO THE BRANDING OF STOCK.

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

1. Sections 7, 8, 9, 10 and 13 of "The Brands Ordinance, 1900" (herein after referred to as the said Ordinance), and so much of any other law as is repugnant to or inconsistent with the provisions of this Ordinance are hereby repealed; but such repeal shall not be taken to affect the

validity of any brand duly registered at the time of coming into operation of this Ordinance.

2. No person shall have the right of claiming to have any special form or design of brand allotted to him, but any person requiring a brand shall, on application, and on payment of the prescribed fee, have a brand allotted to him by the Registrar.

3. Section 23 of the said Ordinance is hereby amended by the addition of the following sub-section:—

"(6) The system and procedure to be observed by the Registrar in allotting brands."

4. This Ordinance may be cited for all purposes as the "Brands Ordinance Amendment Ordinance, 1908."

Above is the text of the Ordinance passed during the last Session of the Legislative Council, the object of the Ordinance being to so amend the Brands Ordinance, 1900, as to permit of the system of branding known as the "Three piece system."

Following are the regulations promulgated under the Ordinance, and which brought the new system of registration into operation on 7th January, 1909.

No. 391* of 1908.
Department of Agriculture,
Administrator's Office,
Salisbury, 17th December, 1908.

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdrew the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

* Republished with corrections.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

9. There shall be payable to the Registrar or Deputy Registrar:—

(a) For every separate registration of a brand, 5s.

(b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next in order, according to the following table:—

i. Off Neck or Rump (or Thigh);
ii. Near Shoulder (or Top of Arm);
iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

i. Off Rump (or Thigh);
ii. Near Shoulder (or Top of Arm);
iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

i. On Near Side or Ribs;
ii. Near Rump (or Thigh);
iii. Off Shoulder;
iv. Off Side or Ribs;
v. Off Rump (or Thigh).

(d) In the case of ostriches:—

i. On Near Thigh;
ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette."

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the provisions of this section shall on conviction be liable to a fine not exceeding £5.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

P. D. L. FYNN,
Acting Treasurer.

SCHEDULE A.

APPLICATION FOR A BRAND.

Brands Ordinance, 1900, and Brands Ordinance Amendment Ordinance, 1908.

To the Deputy Registrar,

.....

Herewith we enclose the prescribed fee of.....and request that you will allot and register a brand for the holding or place mentioned in the Schedule below.

Name of Applicant in full.	Address.	District or Sub-district for which Brand is required.

Date.....

.....

Applicant.

SCHEDULE B.

Brands Ordinance, 1900, and Brands Ordinance Amendment Ordinance, 1908.

No.....

..... day of

I hereby certify that the brand shown in the diagram at foot hereof was duly registered on the date and as the brand of the person(s) therein set forth in the schedule hereto.

Owner(s)' full Name.	Address.	District for which Brand is registered.	Date of Registration.

Fee paid.....

Diagram of Brand.....

(Signed).....

Registrar of Brands.

SCHEDULE C.

MEMORANDUM OF TRANSFER OF BRAND.

Brands Ordinance, 1900, and Brands Ordinance Amendment Ordinance, 1908.

We,.....*.....being the registered owner(s) of the brand set forth in the schedule hereto, do hereby agree to the transfer of the same to.....of.....and hereby request that the same may be registered accordingly. And we....., the second undersigned, do also hereby agree to the said transfer and enclose the fee therefor (..... Shillings).

Witness..... Owner.

Address.....

.....

Witness..... Transferee.

Address.....

.....

Brand.	Name and Address of Registered Owner of Brand.	District where Brand is Registered.	No. of Certificate.	Date of Registration.

.....

SCHEDULE D.

CERTIFICATE OF TRANSFER.

Brands Ordinance, 1900, and Brands Ordinance Amendment Ordinance, 1908.

No..... Date.....

This is to certify that the brand shown at the foot hereof was this day transferred from..... of

to..... of

Fee paid £..... Dated this..... day of

.....

Registrar of Brands.

Brand.	Transferee's Name and Address.	District where Brand is to be used.	No. of Certificate.	Date of Registration.

SCHEDULE E.

DISTRICT BRANDS REGISTER.

Brands Ordinance, 1900, and Brands Ordinance Amendment Ordinance, 1908.

Name of Registered Owner.	Address.	District for which Brand is Registered.	Particulars of Brand.		
			Brand Allotted.	No. of Certificate.	Date of Registration.

SCHEDULE F.

Brands allotted to different magisterial districts and sub-districts.

Dominant Letter.	District denoted.	Brands Series.	
A	Salisbury	A 2 A	and variations.
		A A 2	,,
B	Bulawayo	B 2 A	,,
		B A 2	,,
C	Charter	C 2 A	,,
		C A 2	,,
E	Belingwe	E 2 A	,,
	(Sub-district of Bulawayo) ...	E A 2	
F	Mangwendi	F 2 A	,,
	(Sub-district of Salisbury)	F A 2	,,
G	Gwelo	G 2 A	,,
		G A 2	,,
H	Hartley	H 2 A	,,
		H A 2	,,
J	Bubi	J 2 A	,,
	(Sub-district of Bulawayo) ...	J A 2	,,
K	Wankie	K 2 A	,,
	(Sub-district of Bulawayo	K A 2	,,
L	Lomagondi	L 2 A	,,
	(Sub-district of Salisbury)	L A 2	,,
M	Mazoe	M 2 A	,,
	(Sub-district of Salisbury)	M A 2	,,
N	Bulilima-Mangwe	N 2 A	,,
	(Sub-district of Bulawayo) ...	N A 2	,,
P	Mafungabusi	P 2 A	,,
	(Sub-district of Gwelo	P A 2	,,

Dominant Letter.	District denoted.	Brands Series.	
R	Chibi	R / 2 A	and variations.
	(Sub-district of Victoria)	R / A 2	,,
S	Melsetter	S / 2 A	,,
		S / A 2	,,
T	Tuli	T / 2 A	,,
		T / A 2	,,
U	Umtali	U / 2 A	,,
		U / A 2	,,
V	Victoria	V / 2 A	,,
		V / A 2	,,
W	Gwanda	W / 2 A	,,
	(Sub-district of Bulawayo) ...	W / A 2	,,
X	Makoni	X / 2 A	,,
	(Sub-district of Umtali)	X / A 2	,,

NOTE.—Reserved for distribution (if required), all brands with the numerals as dominants, thus—2 AA to 9 ZZ. Permanently reserved, the letters O and I (to be used exclusively as numerals). The letters O, Y and Z are unallotted. The letter D reserved for Government Departments.

No. 51 of 1909.

Department of Agriculture,

Administrator's Office,

Salisbury, 25th March, 1909.

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by the "Brands Ordinance 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby declare that the following districts have

been added to those shown in Schedule F of Government Notice No. 391 of 1908, and brands allotted as under:—

Dominant Letter or Numeral.	District Denoted.	Brands Series.
Y	Inyanga	2A Y A2
Z	Insiza	Z and variations 2A Z A2
2	Matopo	2 AA 2 ZZ
Q	Selukwe	Q and variations 2A Q A2

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 52 of 1909.

Department of Agriculture,

Administrator's Office,

Salisbury, 25th March, 1909.

CONDITIONS UNDER WHICH GOVERNMENT VETERINARY SURGEON'S SERVICES ARE AVAILABLE TO THE PUBLIC.

1. ON and after 1st April, 1909, the services of Government Veterinary Surgeons will be available to the public, free of charge for the following purposes only:—

(1) Attending and giving professional advice in connection with the following diseases, viz.:—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Footrot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lung-sickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease

amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

(2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

(3) Inoculations against the following diseases:—

Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz.:—

	£	s.	d.
(1) For every professional visit within three miles of his office or residence	0	5	0
(2) For every professional visit beyond such distance plus an additional charge of 2s. 6d per hour whilst engaged in such visits, or £2 2s. a day of 24 hours;	0	10	6
(3) For advice given at the Veterinary Surgeon's office, for each animal, per visit	0	2	6
(4) The following to be charged in addition to visiting fees:—			
a. For every examination as to soundness, each	1	1	0
b. For castration, horses, each	1	1	0
c. ,, bulls ,, ...	0	5	0
d. ,, donkeys ,, ...	0	10	6
e. For parturition cases, mares, each	2	2	0
f. For parturition cases, cows, each	1	1	0
g. For other operations, according to nature, from 5s. to £2 2s.			

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government veterinary surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government veterinary surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these reqests at once, as the veterinary surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to

arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government veterinary surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government veterinary surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government veterinary surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 136 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 1st July, 1909.

FENCING ORDINANCE, 1904.

UNDER and by virtue of the powers in me vested by section 26 of the "Fencing Ordinance, 1904," I do hereby declare that the subjoined Regulations, providing for the erection and closing of gates, shall be applied in any district or area coming under the provisions of the said Ordinance.

1. On and after the "Fencing Ordinance of 1904," becoming operative in any district or area, any owner of land erecting a dividing fence under the provisions of the Ordinance within such area, shall erect swing gates on all existing private or public roads crossed by such fence.

2. The gate and its appurtenances shall be of such size and description as the Civil Commissioner of the district shall fix and determine.

3. A gate shall not be hung on any straining post, but shall be hung on strong posts erected for the purpose, in such a manner as to allow of it being swung evenly on its hinges, clear of the road, and inwards and outwards.

4. Every person or traveller after passing through a gate, shall properly close such gate, according to the provision made for the purpose.

5 No livestock enclosed in a dividing fence shall be allowed to stray through a gate while any person or traveller may be passing through.

6 Any person contravening any of the above Regulations shall be liable to a penalty not exceeding ten pounds for each offence, or in

default of payment of the fine imposed, to imprisonment for any period not exceeding one month, with or without hard labour.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,
For Treasurer

Department of Posts and Telegraphs,

Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EYRE,
Postmaster General.

General Post Office, Salisbury,
20th July, 1909.

South African Stud Book

A RECORD of all classes of Stock, the object being to encourage the breeding of Thoroughbred Stock, and to maintain the purity of breeds, thus enhancing their value to the individual owner and to the country generally.

Applications for Membership, and entries of Stock should be addressed:

For Cape Colony to

A. A. PERSSE, P.O. Box 703, CAPE TOWN.

For Transvaal to

F. T. NICHOLSON, P.O. Box 134, PRETORIA.

For the Orange River Colony

E. J. MACMILLAN, Government Buildings, BLOEMFONTEIN.

A. A. PERSSE,
Secretary South African
Stud Book Association.

AFRICANDER BULLS.

Three Pure Bred Africander Bulls for Sale, two 4-tooth and one 6-tooth respectively.—R. Bliss, Ayrshire.

PERSIAN SHEEP RAMS.

These Rams are all picked from our well-known Longhope Stud; winners of over 100 prizes—Port Elizabeth, Rosebank and Bloemfontein.

I have now a portion of this stud on my farm, near Penhalonga, Rhodesia, and am open to take orders for Rams now on hand, and also to book for next year. Price, £3 10s. on truck, Umtali.—Apply, Douglas Abrahamson, Penhalonga.

By Appointment to  His Majesty the King

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is ALL beef—prime beef in a readily digestible form.

That is why BOVRIL is so invigorating a beverage, so strengthening a food, why cooks find it so useful, why Doctors and Nurses recommend it, why the sensible housewife will have nothing in place of it.

THE RHODESIAN

AGRICULTURAL JOURNAL

Edited by the Director of Agriculture
assisted by the Staff of the Agricultural Department.

VOL. VII.—NO. 2.] DECEMBER, 1909 [5s. per annum.

Editorial.

THE DAIRY INDUSTRY.—It would be a mistake at the stage which we have now reached in the development of the agricultural resources of Rhodesia to speak of it as a dairy-country though that day may not be far distant. On the other hand the system of stock farming which it is necessary to adopt in this country precludes the possibility of following the methods of the American Far West. Constant watching by native herd boys and regular kraaling at night on account of vermin and the unfenced condition of the veld make ranching impossible. The average cow, if well cared for and artificially fed, produces more milk than its calf requires, and this is especially true when cross-bred or imported stock is kept, hence milking becomes a necessity and the utilisation of the milk a very material consideration. No doubt co-operative creameries will arise, although the time is not yet, meanwhile we may welcome any step which opens a market to our dairy products or demonstrates the possibilities of the country from that point of view.

The possibilities of making money by dairy farming have perhaps not been fully appreciated in Rhodesia in the past.

For this state of affairs there are historic grounds—war and pestilence — and economic causes, lack of winter feeding, shortage of labour and absence of proper facilities for handling milk and butter. The market has in the past been served by oversea or southern producers, and indeed still is, as the latest Customs' returns too clearly show.

Of butter, and butter substitutes such as margarine, the total importation during 1908 was 233,138 lbs,, valued at £14,429, of which 27,488 lbs. worth £1,981, was South African produce. Of cheese we imported 135,371 lbs. worth £4,184, of which 1,451 lbs., or just over 1 per cent., was of South African origin ; and of condensed milk 653,892 lbs. costing £12,483, of which 5 lbs. was South African! During the year, therefore, we bought from abroad dairy produce to the value of £28,803.

During the last six months for which statistics are available, March to August of this year, the amounts are all more than half last year's total figures, showing that so far Rhodesia is very far from supporting itself in dairy produce. There is consolation in the fact that more South African produce is being consumed actually and proportionately than heretofore, and no doubt the local industry is increasing too, but there obviously remains a large internal market for the Rhodesian farmer to capture, as the following figures for six months testify :—

	S.A.P.		Not S.A.P.	
	Quantity. lbs.	Value. £	Quantity. lbs.	Value. £
Butter and substitutes	32,638	2,062	89,735	4,980
Cheese	258	12	68,761	2,143
Condensed Milk ...	250	4	397,701	6,514

By degrees however this state of affairs must change and practical signs of this are not lacking. Both at Bulawayo and Salisbury during the last few weeks we hear of commercial enterprises have taken up the matter in earnest. At the former centre Messrs. Bridal & Steel, propose opening a butter factory and are advertising for cream for farms within of radiut of 200 miles, a wide enough range, while in the latter neighbourhood Mr. A. Kincaid Smith of Bluff Hill is also prepared to deal with larger quantities of cream than his own herd can supply although his cow sheds have room for sixty milkers, and he is prepared to take regular supplies of cream from a distance,

DAIRY FARMING.—These undertakings seem to be the rational outcome of the present situation. Most farmers have now considerably more milk than they can conveniently handle, while to produce butter to compete with the high grade and uniform article which reaches us from Australia and the Argentine more skill and better appliances are necessary than most to-day possess. But with the simple help of the separator and proper conveying cans it is an easy matter to deal with cream expeditiously and in a clean manner, and to send it away from the farm a concentrated product, which, if ordinary cleanliness and despatch is exercised still reaches the factory in a fit state of ripeness to make butter of good flavour and proper keeping quality. Most farmers have milch cows but few are in a position to specialise as dairy farmers except such as happen to be conveniently situated for carrying on a fresh milk trade.

THE PROSPECTS OF CHEESEMAKING.

Several enquiries have been made as to the possibility of cheese-making, and there is reasonable prospect of good success in this direction. Certain facts must be borne in mind. Cheese-making is a far more intricate operation requiring much more skill and experience than the manufacture of butter. The art has to be learnt and cannot be very readily acquired. Moreover cheese takes a long time to make, several hours from start to finish of the operation. Moreover it must be made daily, so that the process entails the regular and prolonged daily occupation of a trained person. The average farmer cannot spare the time for this. It is only, therefore, where a large quantity of milk is available and where the work can be done on a scale sufficiently large to enable a skilled cheese-maker to be profitably employed that much is to be expected of this form of industry. On the other hand, as every gallon of milk can furnish a pound of Cheddar cheese it offers one of the best means of converting milk into money, especially for those situated at a distance from market. Cheese is a concentrated product, which keeps well and does not require immediate consumption, if well made it fetches remunerative prices and the plant required does not exceed the means of any one already well enough off to own the requisite number of cattle. In most parts of Rhodesia the range of temperature is not too great to hinder cheese-making. In certain regions the seasonal flush of milk

and corresponding scarcity render a constancy of supply out of the question, but cheese-making offers an excellent method of dealing with this annually recurring excess.

RUBBER.—As yet litttle has been done to realise, or even ascertain, the possibilities of rubber culture, but there is good reason to think that some parts of Rhodesia are quite suited for some sorts of rubber. For several years past Mr. Swynerton, at Gungunyana, in South Melsetter, has been experimenti ng systematically, and his Ceara trees, some 3,200 in number, are now approaching the age when tapping may be commenced. Great credit is due for the patient painstaking and practical manner in which the trial has been conducted and it is to be hoped that it may soon be crowned with success. The trees look well but it is imsossible at this stage to foretell what amount of rubber the latex will yield although tentative tappings are promising. Indigenous Landolphia yields well and Mr. Swynerton has propagated it it artificially with results which so far are quite encouraging. There are prospects of further rubber planting operations being undertaken in the district but the above mentioned experiments must be recognised as the pioneer enterprise of the kind in the country.

FARMING IN THE BULALIMA DISTRICT. — The notes which will be found on another page dealing with farming matters in the South West corner of Rhodesia are based upon visits of inspection paid at different times. They are intentionally descriptive and critical, with the object of informing those in other parts of what is being done and of the nature of the difficulties and problems facing farmers there.

It is hoped to deal in a similar manner with all districts in succession to which end the Editor will be glad to receive photogrraphs or inrormation which may be helpful in giving a true picture of the present rural conditions, natural and economic in the various parts of Rhodesia.

COFFEE.—We are very yet from realising all the possibilities of the wonderful region we inhabit. It will no doubt be a surprise to many to learn that over a score of farmers in the Melsetter district are engaged in the profitable cultivation of coffee, possessing amongst them close on 35,000 coffee trees, while there is ample scope for a very much extended culture of this profitable crop. Introduced some twelve years ago it

is comparatively recently that cultivation has become general and last year somewhat over half the above number of trees were in bearing yet the estimated crop was well over 20,000 lbs., for which the growers are getting from 8d. to 10d. per lb. Insect pests are a trouble but are by no means yet a menace. Most coffee growers are busily engaged in extending their plantations and the prospects of coffee are distinctly encouraging.

A FARMERS' HALL.—The Farmers' Association at Marondellas is to be congratulated on the completion of a hall wherein its meetings in future to be held. The building is of brick, very substantially constructed, and reflects great credit on the Association for its energy and enterprise. It will no doubt serve many useful social purposes in the district, but is primarely intended as a meeting place for the farmers, and was erected entirely at their own expense on a site granted by the British South Africa Company. While not the first hall of the kind in the country—the Gazaland Association having for years met in a building of its own, though one of less archetectural pretentions—yet the Marondellas Farmers' Association may be complimented on possessing the finest to date, and on having set an example which other Associations will do well to follow.

STUMPING.—Every farmer knows the tedious labour involved in clearing land for cultivation, especially where the original scrub or trees have been felled in the native manner two or three feet above ground and the root left alive. Mr. Wentworth D. Gray has called attention to an American method tried by Mr. Castens of Merion, Inyazwa, which holds out a prospect of overcoming this difficulty in a simple fashion. The process is more especially applicable to large stumps which would take a long time to grub out in the ordinary manner. The procedure recommended is to bore a hole with an augur about three inches deep into the tree or stump to introduce a drop of mercury and then a small quantity of saltpetre. A day or two later the stump is set alight and smoulders away in the manner of a slow match for several days till it is burnt out to a considerable depth below ground. The proper season is when the sap is not

flowing. It would be interesting to learn the experience of others who may try this plan. Possibly differences will be found in treating different kinds of trees.

FENCING.—The work of fencing in the area infected with African Coast Fever at Marandellas is now well advanced and will be a material aid in ceecking the further spread of the disease. The erection of a stretch of fencing on the border between the Tati Concession and Matabeleland is also being pushed on and when completed will serve as a prevention to the entrance of stock from over the border whether accidentally or otherwise.

OUR CALVES.—We would call attention to some hints given to stock-breeders as to the care of their calves, by Mr. Bevan, M.R.C.V.S. While no doubt specific diseases do occur and cases require medical treatment, much may be done, as the writer points out, in avoiding chances of infection and in ensuring that the calves shall be born and reared in clean wholesome surroundings, and that they be adequately nourished. The procedure prescribed necessarily entails outlay and a little trouble, yet the breeder must remember that the cost of disinfectants and the labour of cleaning or moving a kraal to a new site is much more than made up for by the reduced mortality and improved health and condition of the cattle.

THE JOURNAL.—It may be of interest to our friends to learn that this issue is the largest in point of numbers ever brought out, a thousand copies having been struck off; the previous Journal of which 900 copies were printed having fallen short of the demand. In order to enhance the interest of the Journal, the Editor will welcome contributions from farmers and others, or any suggestions whereby its utility may be increased to those whom it is especially intended to serve.

AN ENQUIRER.—Will our correspondent of the above "non de plume" kindly furnish address, when a reply will be sent off before next issue. (Ed., R.A.J.).

The Importation of Plants, &c. Regulations.

By RUPERT W. JACK, F.E.S., Government Entomologist.

The present regulations came into force on June 1st, 1906, but it is felt that farmers and others in Southern Rhodesia will appreciate an explanation of underlying motives and intentions of the various provisions of these regulations, with which perhaps they are only familiar as obstructive difficulties in the way of their importing plants from abroad. The regulations concerning the importation of plants are nearly uniform in all the British Colonies of South Africa and the Rhodesian regulation are essentially similar to those of Cape Colony. The principles which underlie the various sections have therefore long been familiar to the writer, who has recently been charged with their enforcement in this Territory. The ordinance, under which these regulations were put in force, is No. 20 of 1904, and it is described in the heading as an ordinance to regulate the introduction into Southern Rhodesia of any plants or cuttings likely to disseminate insects or diseases affecting plants. Regulations under this ordinance were put in force in 1904, but were withdrawn in favour of the present schedule as a result of an effort in 1906 to secure uniformity in this respect throughout South Africa. This effort was not absolutely successful at the time, though nearly so, the difference in the regulations themselves being but slight, but since then certain colonies have departed considerably from the others in using the discretionary powers given under their regulations, so that the restrictions are far more severe in some States than in others. This is notably the case with Potato diseases.

The first question to be answered in connection with the framing of such regulations as these is, obviously enough, whether the industries to be protected and the danger attending plant importations justify the expense of inspecting and if necessary of treating all consignments of plants introduced.

In answer to this it is only necessary to say that there are many insect pests and plant diseases which are found in other parts of the world, but which do not occur in South Africa, although undoubtedly fitted to thrive and do a great amount of damage here, were they to become established, and to give a sharp set back to some sections of our agricultural industries. It is not possible to regard these regulations from a purely Rhodesian point of view; they affect the whole of South Africa. Insect pests and plant diseases respect only natural not political boundaries. A new pest that became established in Rhodesia would not only be a tax on the cultivation of the crop attacked within our borders and possibly seriously retard the development of an industry, but might be a standing menace to established industries in other portions of South Africa and cause the most rigorous regulations to be put in force against certain classes of Rhodesian produce. There are some pests that might easily be introduced, against which eradicative measures would be practically hopeless once the pest became established, and against which the South African Colonies might build walls of regulations in vain. I allude to such insects as the Gypsy Moth (Porthetria dispar), and the Brown Tail Moth (Euproctis chrysorrhoea). Both of these are natives of Europe but having been introduced into the United States have there wrought so much havoc that special appropriations of money have been made each year with a view to keeping them in check, but in spite of all they continue to extend their range. South Africa had a narrow escape from the introduction of the Brown Tail Moth last year and the incident came under the notice of the present writer, who was then acting as Inspector of Plant Imports at the Cape. A large consignment of pear stocks was introduced from near Orleans, in France, and the Cape authorities, as usual, took very great care with the inspection of them. About 50 of the winter cocoons of the Brown Tail Moth were found attached to certain of the stocks, each cocoon containing some hundreds of the small larvæ. The stocks were fumigated and on reinspection it was found that a number of the larvæ were still alive. The stocks were then gone over and all the cocoons that could be found were cut off and burnt, and the entire consignment then refumigated. One cocoon was taken to head quarters and the larvæ reared in a cage on pear leaves and in due course the larvæ spun up and

the moths began to emerge freely. But for the regulations South Africa would without doubt have added another very destructive pest to its already long list.

I have here mentioned two dangerous pests that might easily have been imported into South Africa were unrestricted traffic in plants permitted, but the name of such pests is legion. The "San Jose Scale" (Aspidiotus perniciosus) costs the United States thousands of pounds each year to combat. The "Oyster Shell Bark Louse" (Mytilaspis pomorom) is the worst pest of apple trees in the British Isles and attacks a wide range of other trees. The "White Fly" (Alcyrodes citri) is a bad pest of citrous trees in Florida and might well thrive under Rhodesian conditions; the damage by the "Cotton Boll Weevil" (Antonomus grandis) was estimated at about 25,000,000 dollars in the U.S.A. for 1907; the destructiveness of the "Hessian Fly" (Mayetiola destructor) is well known and there are hundreds of other insects hardly less harmful than these famous pests. In addition there is the wide field of plant diseases, including "Peach Yellows" and "Peach Rosette," "Black Rot" of grapes, "Black Knot" of certain stone fruits, "Plum Pockets," and a host of others. It must be borne in mind also that pests which may be of minor importance in certain lands might assume much more serious proportions if introduced into this country.

The necessity for the adoption of restrictions in regard to the importation of plants, then, will be generally admitted. Our agricultural industries in Southern Rhodesia may be in their earliest infancy, but their promise is sufficient to justify the expenditure entailed in protecting them from new destructive pests. With plants grown in South Africa there is, of course, little danger of introducing pests that do not already occur in this territory, if we except the Codling Moth, which may or may not occur here already, and the Downy Mildew of the grape, the apparent range of which is known to be circumscribed in Cape Colony and has given rise to special restrictions. The regulations regarding South African produce, however, aim at ensuring a supply of clean plants to the farmers and preventing the constant introduction of destructive pests to set up new centres of infestation.

Let us now consider the various provisions of the regulations :—

IMPORTATION OF PLANTS, &c., REGULATIONS.

1. In these regulations the following terms shall have the meanings respectively assigned to them if not inconsistent with the context and subject matter :—

"*South Africa*" shall mean that portion of Africa including the British South African Colonies and that portion of Portuguese territory lying south of the Zambesi River.

"*Inspector*" shall mean any person appointed by the Administrator for the purpose of carrying out the provisions of these regulations.

"*Plant*" shall mean any tree, shrub, or vegetable, and the fruit, leaves, cuttings, bark, or any part thereof whatsoever whether severed or attached.

"*Nursery Stock*" shall mean trees or plants of any kind, not being vegetables, grown or cultivated for the purpose of trade and with the intention of their being sold, or distributed for the purposes of their being grown elsewhere than on the premises where they stand.

"*Insect Pest*" shall mean any insect or other invertebrate animal which may be injurious to agricultural or horticultural products.

Section beginning "Plant Disease"—

"*Nursery*" shall mean any land or premises whereon is grown or cultivated any nursery stock, and includes any piece of ground adjoining such land or premises and held by the same owner or occupier, on which are grown fruit trees, plants or shrubs not intended for sale.

"*Nurseryman*" shall mean the owner, occupier or other party responsible for the management of a nursery.

2. These regulations shall apply generally to any plant entering Southern Rhodesia.

The first two Sections call for no remark.

3. (1) Any plant or any package, case, or other covering of the same, may before being delivered to the consignee, be detained and examined by an Inspector. so as to determine as far as possible whether or not any insect pest or plant disease is present, and it shall be the duty of the consignee or his agent to open the coverings and to afford every facility to the Inspector during his examination.

(2) Such articles may, when deemed necessary by an Inspector, as a precautionary measure against the introduction of any insect pest or plant disease, be treated by or at the expense of consignee in the manner prescribed by and to the satisfaction of the Inspector, and if not so treated, or if the treatment be deemed ineffectual the Inspector shall destroy the consignment.

Arrangements for inspection and treatment of imported plants have been made at Bulawayo, Salisbury, and Umtali, and special instructions have been given to the Examining Officers at these places, so that uniformity of treatment for each class of plant imported has been assured, throngh whichever port of entry they may be introduced. The second portion of this Section gives necessary discretionary power to the inspector concerning the treatment of plant pests.

As far as Southern Rhodesia is concerned there is no intention of going to undue extremes in dealing with plant imports under the powers granted in the above.

> 4 (1) Any article subject to examination under these regulations which is introduced into the Colony by post may be intercepted and examined by an Inspector, and if found infected with any insect pest or plant disease, shall be destroyed or cleansed at the discretion of any Inspector to whom the power may be delegated by the Administrator, and any such article may, as a precautionary measure, be treated by the Inspector.
>
> (2) All expenses incurred under this regulation shall be paid by the addressee.

This Section provides for the treatment of parcels of plants arriving by post in the same way as those arriving by goods. It may be mentioned here that plants brought in passengers' luggage are similarly treated.

> 5. The inspection and treatment of any consignment imposed by these regulations shall take place on premises provided by the Government for the purpose, but special arrangements may be made with the Director of Agrtculture for the execution of all the provisions of Regulation 3 on the premises of the consignee or other place when approved facilities are provided.

It is to the benefit of both the importei and the inspector for the examination of a large consignment of plants to take place on arrival at their final destination, when facilities for treatment in accordance with the regulations are provided and an inspector's presence can be conveniently arranged for. The importer benefits in that the plants are only subjected to one process of unpacking, and the inspector gains in space and convenience. No standing permits, however, will be issued to any party to have imported plants inspected on his premises; special arrangements will be made in connection with each consignment.

> 6. If any article in the examination provided for in Regulations 3 and 4 shall be found actually infected in whole or in part with any

> insect pest or plant disease it shall, together with all other articles in the same receptacle, and including all packing material, be cleansed and disinfected by and to the satisfaction of the Inspector, or if any treatment at command be deemed by him to be ineffectual for the absolute eradication of the insect pest or plant disease, or if the Inspector referred to in section 4 (1) considers the insect pest or plant disease to be of a specially dangerous character, the articles may, upon his instructions, be destroyed without delay, no compensation being paid.

The treatment of consignments of plants infested with pests is here provided for. The Examining Officers receive definite instructions with regard to the measures to be taken to cleanse plants of the various classes of pests, and any pest unknown to them is forwarded to the Agricultural Department and the consignment detained until instructions are received. As has been mentioned there are some pests which are considered so dangerous that their presence might be the cause of the destruction of a whole consignment of plants without any cleansing measures being attempted.

> 7. On an Inspector being satisfied with respect to a consignment that all the regulations herein set forth have been duly complied with, he shall issue a certificate to that effect to the consignee or addressee, but before the issue of such certificate the consignment shall be under the Inspector's control for the purposes of these regulations.

The Examining Officers are provided with printed certificates to this effect.

> 8. The consignee shall, when called upon to do so by an Inspector, furnish a certificate with respect to any consignment showing the name and address of the consignor or shipper and the number and kind of packages, and any and all particulars of name, quantity, variety, grade, marks and place of origin of the articles.

It is obviously necessary for an inspector to have the power to demand these particulars. The Examining Officers have been furnished with forms, calling for the above information, which have to be filled in and signed by the consignee or his agent before a consignment of plants can be delivered.

> 9. The Government does not hold itself responsible for any loss or damage that may result from the destruction of articles under these regulations, or from any process or detention that may be considered necessary or desirable to cleanse or disinfect the articles or to discover the existence or otherwise of any insect pest or plant disease.

It is sometimes necessary for the purposes of thorough inspection to cut open fruit or other portions of plants, to open up and expose the roots, etc., but care is always taken to avoid damage whenever possible.

PART I.—OVERSEA REGULATIONS.

10. No person shall introduce any plant from places beyond South Africa except by post or through the following seaports:—Beira, Lourenco Marques, Durban, East London, Port Elizabeth, Mossel Bay and Capetown, or such Ports of Entry as the Administrator may allow by special permit.

The above provision is made to enable the authorities to control the traffic. They constitute the ports of entry for the colonies in which they are situated, and it is thus rendered possible to make arrangements, if desired, for the inspection and treatment of certain classes of plants consigned to Rhodesia, though there are no such arrangements at the present time.

11. No person shall introduce into Southern Rhodesia from any place beyond South Africa:—

(a) Any eucalyptus, acacia or coniferous plant, or any portion thereof, with the exception of seeds.

(b) Any stone fruit tree or any living portion thereof which was grown or produced in any part of North America, in which any of the diseases known as Peach Yellows or Peach Rosette exists.

(c) Any Live Peach Stones.

(d) Any stocks (that is, young rooted plants intended for budding or grafting purposes) whatever, except those of the following, which may be imported in bulk only, that is to say, in quantities of not less than 1,000:—

1. Pear.
2. Plum.
3. Apricot.
4. Cherry.
5. Mango.
6. Persimmon.
7. Apple stocks which are accepted by any Inspector to whom the power may be delegated by the Administrator as being resistant to the attack of Woolly Aphis (Schizoneura lanigera).

(e) Timber of any sort with the bark on, except scaffolding poles from the Baltic Sea or from Canada, and except piles of the Turpentine Tree (Syncarpia laurifolia).

This Section certainly calls for some explanation, as to the uniniated it must seem strange why certain classes of trees, etc., should be prohibited, and not others. It will be necessary to consider each sub-section in detail.

(*a*) These trees are widely grown in South Africa and are comparatively free from insect pests and disease, although suffering considerably in their native countries. The reason of this is that they grow well and quickly from seed and have on this account been introduced to this country in the form of seed. This is the safest way to introduce any tree, since the seed is not so liable to bring the native disease with it as are rooted plants or cuttings. There is no hardship entailed in this prohibition and it safeguards our forest plantations.

(*b*) Peach Yellows is an exceedingly destructive disease, which has done an enormous amount of damage in parts of the United States, in many instances wiping out whole orchards. The cause of it has not been definitely traced to any specific organism but it seems to be established that it is infectious in a high degree and probably capable of being transmitted even through the seed. The same remarks apply to Peach Rosette, although this disease is not so destructive as the Yellows.

(*c*) An additional precaution against Peach Yellows.

(*d*) Fruit tree stocks are a very lively source of danger and their introduction has been prohibited wherever this can be done without hardship. Nurserymen, however, consider that they cannot raise certain stocks satisfactorily in South Africa, and have been in the habit of importing them in bulk each year, so it has been considered best for the interests of the country to permit certain species to be introduced. The only apple stock accepted officially at present as being "blight-resistant" is the variety known as Northern Spy.

(*e*) This sub-section was introduced for the protection of the South African forests, as timber with the bark on is apt to shelter plant pests, especially borers and bark infesting beetles. The two exceptions were made in order to avoid causing hardship as these articles are imported fairly largely for special purposes.

12. The introduction of the following plants or of any portions thereof into Southern Rhodesia from places beyond South Africa for propagation, except seeds and fruit, shall be limited to importations made by the Government under such precautionary measures as it may deem necessary :—

1. Grape vines or other plants of the family Vitaceae.
2. Sugar cane.
3. Plants cultivated for the production of rubber.

The three classes of plants mentioned in this section are limited as stated above in order to minimise the danger of introducing pests which might seriously affect certain staple industries in South Africa. Grape vines are restricted in this way chiefly for the benefit of the wine industry of Cape Colony, sugar cane for the benefit of Natal, and rubber plants for the protection of the rubber industry. In connection with these things we must bear in mind that we form a part of South Africa.

13. No person shall introduce from places from beyond South Africa any flowering or ornamental plant except by special permission of the Secretary for Agriculture, who may grant or withhold such permission at his discretion.

14. (1) Subject to the foregoing, any other tree or fruit-bearing plant or scion or other part thereof for propagation may be introduced only after a special permit has been obtained from the Secretary for Agriculture. Such a permit shall only be issued at the discretion of the Secretary for Agriculture, and it shall limit the introduction to not more than ten trees or 100 cuttings of any one variety, and shall not be issued for more than an aggregate of 100 trees or 1,000 cuttings to any one person during any one year.

(2) For the purpose of this clause the term "tree" shall include any plant of the nature of a tree. In case of dispute as to whether any plant falls under this restriction, the decision of any Inspector to whom the power may be delegated by the Administrator shall be final.

These two Sections may be considered together. If we first thoroughly assimilate the fact that every plant introduced into South Africa is a source of danger, not only to its own species and allied plants, but also to fruit and forest trees, the economic value of these restrictions becomes clear. There is at the present time a very wide selection of ornamental plants and fruit trees which are stocked by the nurserymen in South Africa, and it is not only safer to the country to use this source of supply when possible but also greatly to the benefit of the purchaser to buy acclimatised plants, as it is really astonishing how many plants imported from oversea fail to establish themselves, even though they appear healthy on arrival. Permits are freely issued for the introduction of new varities of flowering plants, and there is really little danger with such plants as carnations, pelargoniums, geraniums, chrysanthemums, etc., when purchased from reputable nurserymen in Europe. The restriction on the numbers of fruit bearing plants and trees is warranted by the danger that attends such introductions. It is possible to make a much more thorough inspection of a small consignment than of a large one and the end in view is to limit the issue of such permits to parties who wish to introduce new varieties either for private use or for the purpose of propagating from them for sale, but not to allow large quantities to be imported for sale direct. Permits will not as a rule be issued for the introduction of forest trees and other plants that can be easily reared from seed.

This concludes the Oversea Regulations.

PART 2.—INTER-COLONIAL REGULATIONS.

15. No person shall introduce into Southern Rhodesia from any other part of South Africa :—

(a) Any cutting of any grape vine or any grape vine unless the same is resistant or grown upon roots resistant to the attack os the grape phylloxera (Phylloxera vastatrix).

(b) Any apple stock or tree unless grown upon Northern Spy roots or other roots which are accepted by the Inspector referred to in Section 4 (1) as being resistant to the attacks of the Woolly Aphis (Schizoneura lanigera).

(c) Any tree or plant that was propagated beyond South Africa unless the introduction of the same would have been permitted under Section 11 of these regulations.

Grape vines and apple trees are rarely offered for sale in South Africa unless grafted upon the stocks prescribed in this Section, so that there is little difficulty in complying with these provisions. Sub-section (*c*) is, of course, controlled by Section 10 of the Oversea Regulations and by Sections 16 and 17.

> 16. No person shall introduce into Southern Rhodesia from other parts of South Africa any nursery stock except under the following conditions:—
>
> (a) That the nurseryman from whom the stock is obtained holds a permit from the Secretary of Agriculture for the introduction of such nursery stock into Southern Rhodesia. Such permit shall be granted if the Secretary of Agriculture is satisfied from the report of the Government Entomologist of the Colony in which such nurseryman's premises are situated, that no restriction on the removal of the stock would be imposed were the premises situated in Southern Rhodesia. Any such permit may be cancelled by the Secretary for Agriculture, and it shall expire 12 months from the date of the inspection on which it was based.
>
> (b) That any fruit tree, fruit-bearing plant and any portion thereof, other than fruit and seed, has been fumigated prior to shipment with hydrocyanic acid gas in a chamber and by a method approved by the Government Entomologist of the Colony in which the nursery is situated.
>
> (c) That every consignment is accompanied by a certificate in the form "A" appended to these regulations, which specifies the number and kinds of plants contained in the consignment, and shows that the provisions of Sections 15 and 16 of these regulations have been observed.

The above Section goes so much into detail that little need be added in the way of explanation. A nurseryman desiring the privilege of introducing his stock into this territory must apply to the Entomologist of the colony in which his nursery is situated. His application is forwarded to the Agricultural Department here together with a copy of the nursery inspector's last report on the condition of the nursery and his recommendation concerning the advisability of issuing such a permit. The application is then considered on its merits. The copies of Form A. received are forwarded to the Agricultural Department at the end of each month and the inspector is thus able to check any misuse of these forms. The regulations in the other colonies are exactly similar in regard to nursery stock from other parts of South Africa.

17. Other than is provided for in Section 16, no person shall introduce into Southern Rhodesia from other parts of South Africa any plant or portion thereof with the exception of:—

(a) Vegetables or vegetable transplants.
(b) Cut flowers.
(c) Fruit.
[d] Seeds.
[e] Plants or portions of plants not to be grown; unless the following conditions are complied with:—

1. That each consignment is accompanied by a certificate in the form "B" appended, which specifies the number and kinds of plants contained in the consignment, and shows that they were not grown in a nursery and that the provisions of these regulations as stated in section 15 have been observed.
2. That no consignment shall consist of more than 10 plants or cuttings of any one variety without special permission of the Secretary of Agriculture, which permission may be granted or withheld at his discretion.
3. That when any fruit tree, fruit-bearing plant, rose plant or any portion thereof is included in a consignment, such consignment shall in transit be delivered to the Inspector at Bulawayo, Salisbury or Umtali for purposes of inspection and treatment. If, however, such consignment is accompanied by a certificate from the official in charge of nursery inspection of the Colony in which the plant was grown to the effect that the plant is apparently free from insect pests and plant disease, the conssgnment shall be received at any place in this territory.

A small amount of traffic in plants from private individuals is allowed, but a restriction in numbers is imposed in order to prevent nurserymen from misusing the forms provided for this Section. Special permission for the introduction of larger quantities may be granted to meet special circumstances, but such permission will not be given unless a very good case is made out to justify the introduction.

18. Any person guilty of a contravention of these regulations shall be liable to a fine not exceeding £10, or in default of payment to improvement with or without hard labour for a period not exceeding one month.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator.

E. ROSS TOWNSEND,
Secretary for Agriculture.

FORM A.

SOUTH AFRICAN INTER-COLONIAL PLANT IMPORT REGULATIONS.

CERTIFICATE required with every consignment of nursery stock exported from Cape Colony, Rhodesia, Orange River Colony, Transvaal or Natal to any other of these Colonies.

Consignee's Name..... Consignee's P.O. Address.....

For despatch by post / rail from.....P.O. Station to.....P.O. Station.

Number and description of Packages.	Kinds of Trees or Plants.	Number of each kind.

I hereby certify that the particulars given above of the consignment herewith despatched are true and complete, that I hold an Official permit for the introduction into.....of the nursery stock described, and that I have complied with all the requirements of the Plant Import Regulations of the said Colony which apply to the said stock.

(Signed).....
Registered Nurseryman.

The consignment above described was this day delivered by me,

.....
Inspector or Examining Officer at destination.

Place.....

Date.....

[OVER]

(Reverse of Form A).

APPLE TREES from one Colony to another must be on the Northern Spy roots or other roots officially accepted as resistant to the attacks of Woolly Aphis in the Colony to which the trees are sent.

GRAPE VINES must be on roots resistant to the Phylloxera, and all cuttings of grape vines must be of resistant kinds.

ALL FRUIT TREES, FRUIT BEARING PLANTS AND PORTIONS THEREOF must be FUMIGATED immediately prior

to shipment with hydrocyanic acid gas in a chamber and by a method approved by the Government Entomologist of the Colony in which they were grown.

It is required that a certificate in this form be presented with and accompany every consignment of nursery stock from any Colony for any other Colony, whether to go by post or rail, and that the Inspector or Examiner at the delivery post office or railway station sign the form and despatch it at the end of the current month to the Government Entomologist of his Colony.

The consignor is recommended to send a *duplicate of the certificate* by post to the consignee so that delay may be avoided should the original certificate go astray. The Inspector or Examining Officer is authorised to accept the duplicate.

FORM B.

SOUTH AFRICAN INTERCOLONIAL IMPORT REGULATIONS.

CERTIFICATE required with every consignment of plants not nursery stock and not specially excepted exported from Cape Colony, Rhodesia, Orange River Colony, Transvaal, or Natal to any other of these Colonies.

Consignee's name..... Consignee's P.O. Address.....

For despatch by post / rail from..... P.O. Station to..... P.O. Station.

Number and description of Packages.	Kinds of Trees or Plants.	Number of each kind.

I hereby certify that the particulars given above of the consignment herewith despatched are true and complete, that none of the said plants are from any nursery, and that no apple tree, grape vine, or grape vine cutting in violation of the regulations has been included.

Date..... (Signed).....

The consignment above described was this day delivered by me,

.....

Inspector or Examining Officer at destination.

Place

Date

[OVER]

(Reverse of Form B.)

APPLE TREES despatched from one Colony to another must be on the Northern Spy roots or other roots officially accepted as resistant to the attacks of Woolly Aphis in the Colony to which the trees are sent.

GRAPE VINES must be on roots resistant to Phylloxera, and all cuttings of grape vines must be of resistant kinds.

NO CERTIFICATE is required with (a) vegetables or vegetable transplants, (b) cut flowers, (c) fruit, (d) seeds, and (e) plants or portions of plants not to be grown.

With the exception of nursery stock, which is subject to special restrictions and must be accompanied by another form of certificate, all other plants are subject to the conditions noted hereunder and must be accompanied, whether sent by rail or post, by a certificate in this form. The Inspector or Examining Officer at the delivery post office or railway station is to sign the form and despatch it at tne end of the current month to the Government Entomologist of his Colony. The consignor is recommended to send a *duplicate certificate* under separate cover to the consignee so that delay in delivering the consignment may be avoided should the origihal have gone astray; the delivering official is authorised to accept the duplicate.

TEN PLANTS or cuttings of any one variety is the limit that may be sent in a single consignment, unless special permission to send more has been obtained from the Commissioner of Lands; ordinarily, such special permission will be endorsed on this form.

ANY FRUIT TREE, FRUIT BEARING PLANT, ROSE PLANT, or any part thereof for the Transvaal, Orange River Colony, Natal, or Rhodesia must, unless certified by the official in charge of nursery inspection of the Colony in which it was grown to be apparently free of insect pests and plant disease, be sent in transit to an Inspector for the receiving Colony for the purpose of inspection and any required treatment. Inspectors for the Transvaal are located at Johannesburg and Pretoria; for the Orange River Colony at Bloemfontein; for Natal at Pietermaritzburg; for Rhodesia at Bulawayo, Salisbury and Umtali; and for Cape Colony at Cape Town and Grahamstown.

The items of the regulations have now been considered in detail and it is hoped that the explanation given will enable those affected to understand and appreciate the various provisions better than they have been able to do in the past and perhaps to regard the regulations with a more spmpathetic eye.

The Care of Calves.

By Ll. W. BEVAN, M.R.C.V.S.

During the past few years the mortality among calves in Southern Rhodesia has assumed alarming proportions. Indeed, in some districts so heavy have been the losses that disappointed breeders have come to the conclusion that the future prosperity of the stock-raising industry in this country is foredoomed.

Now, while it must be admitted that a goodly number of the deaths have been due to the diseases to which all young stock are heirs it would not be too much to say that a large proportion of the deaths may be directly or indirectly attributed to the faulty management and injudicious treatment of the young stock by careless and inexperienced owners.

It stands to reason that where the natural vitality of young animals is weakened by insufficient and improper feeding or by insanitary surroundings, disease, when it comes along, easily gains a footing and gathers strength as it passes from one victim to another. Not only does a malady, simple perhaps in itself, assume the form of an epizootic, but the scene of the outbreak becomes "stale," and each succeeding lot of calves contracts the disease and so succumbs and carries on the infection.

In order to deal with an existing focus of disease one must devote attention to the eradication of the disease in the in-calf cows; in the premises on which the calves will be born; and on the pastures on which they will graze. Too much regard cannot be paid to the health and comfort of the mothers while they are heavy in calf, so that they may "do" their unborn calves well and start them in life with the best preventative against disease, namely, a good constitution. Finally the calves themselves, at the time of birth and after, must receive proper care and treatment.

It may appear foolish to treat the cow before her calf is born, but we have in the disease known as "contagious abortion" an example of a germ living in the genital passages of



A Badly Nourished Calf

the cow and, in connection with one important calf disease in Salisbury District, evidence is available which would point to the infection of the calves before birth. However, if purely theoretical, the issues at stake when an infectious disease of calves exists on a man's farm are so great, that no means should be left untried in the endeavour to eradicate it. Moreover it is not a matter of great difficulty. The dipping of cows in any of the best antiseptic dips disinfects them externally, and the flushing out of the vagina of cows about to calve with a weak solution of carbolic acid (say 3 per cent. in warm water) is easily carried out with an ordinary spray pump, the nozzle of which has been removed.

Cows heavy in calf should be put to calve in an area known to be free from infection, or in a place thoroughly disinfected before-hand. For this purpose the spray-pump again comes into use and some such simple disinfectant as Jeyes' or MacDougal's dip may be employed. Two pounds of blue-stone dissolved in three gallons of water makes a valuable and economical solution for the purpose. Sunshine and fresh air in themselves are good germicides so that chief attention has to be paid to dark places where Nature's disinfectants cannot penetrate. Special attention should be paid to those places which have been soiled by previous sick animals. The dirt from old calf-houses and byres should be collected and burnt and the places should be disinfected and limewashed.

When the calf is born its naval should be washed with an antiseptic (preferably Iodine dissolved in spirit) and an antisceptic ligature, such as a piece of fine twine dipped in carbolic or other disinfectant, should be passed round it at an inch from the belly. After a little tuition natives of average intelligence will learn to do this, but it is best for the owner himself to carry it out, for the results will probably compensate him for his trouble.

In Rhodesia, calves are early infested by ticks, which convey to them the parasite of "red-water." These young animals are comparatively resistant and in course of time become tolerant to the disease. At the same time, the disease produces certain debilitating effects and predisposes them to the invasion and ill-effects of other disease-producing organisms. For this reason it is advisable to limit the

number of ticks on a pasture by regular spraying or dipping of all live-stock on the farm. The calves themselves should also be kept free from ticks, and when a few weeks old can be dipped or sprayed with perfect safety. A little aloes added to the dip reduces the danger of poisoning which sometimes occurs from animals licking one another or the ground on which the dip has drained.

An interesting observation may be mentioned here in connection with the value of dipping. At a recent demonstration of the new Edmonds combined dipping and spraying tank, ticks were taken from cattle before and after immersion. The ticks were afterwards kept in glasses under suitable conditions. After a week it was observed that both lots of ticks were still alive. It might have been thought that the dip was useless, but within the next week the value of the process was demonstrated, for it was found that the dipped ticks had not laid a single egg, while the undipped ticks had laid large masses of eggs which have since hatched out into thousands of larval ticks.

Ticks and disease seem to co-operate. While tick invasion gives way to disease, disease often causes a dry, unhealthy state of the coat which seems to predispose an animal to tick infestation. Some of the common dips set up a dry, harsh condition of the skin which favours ticks. The following agent has been found serviceable in keeping the skin soft and healthy and the coat glossy and in good condition:

Potassium Sulpharata ...	2 ounces.
Warm water	2 gallons.

The solution should be prepared at the time of using and should be applied as a wash or spray. It does not destroy ticks but may sometimes be used instead of a dip or between the regular dippings on account of the good state of the skin it produces—itself a tick preventative.

Winter feeding should be prepared where pastures are poor. In the dry cold weather cows and calves often receive such a severe set-back that they never properly recover. The hunger of the mother in the dry season is reflected in her calf. On the other hand, the muddy and dirty condition of calf houses and cattle kraals during the summer rains are favour-

able to the development of microbes, and it is then that ticks are most plentiful. Care should be taken to provide clean and well ventilated quarters.

There is a fable concerning a dog which having a large bone in its mouth, saw its reflection in a pool, and desiring the bone of the dog it saw there, dropped its own into the water in its greedy endeavour to secure both. The fate of this dog might be borne in mind by the dairyman who wishes to rear calves and make a big profit by the sale of his milk and butter. In this country where the milch cows are not of a very high order and the yield small and uncertain, the two things cannot go together without special care and appropriate feeding of both cow and calf. If it is desired to grow well developed calves for beef, trek or breeding purposes from ordinary veld fed cows, the idea of profit from the dairy must be given up.

This has been constantly preached in this Journal. Years ago Mr. Cameron drew attention to the mistake which was threatening to ruin the prospects of the stock-raising industry in this country, but, unfortunately the state of things which existed then is met with to-day. So common is it to see the starvation of the calf for the sake of the few shillings derived from the milk of which it has been robbed, that a condition of calves is now recognised by the Rhodesian Veterinary Surgeons as "Separator Sickness."

Some more conscientious breeders, while passing their milk through the separator return to it substitutes for the butter fat removed. But in this country calf meals, cod liver oil, etc., are so expensive that it is doubtful if the calf ever really is compensated for what the milk has lost both in quality and quantity.

When the calf fails to "fill out" as it should do the explanation is offered that there is some undefined factor in the conditions of the country, such as the absence of proper bone-making salts, which is to blame. This argument, however, points to the necessity of giving calves the food which contains these elements in the best and most assimilable form, namely, the natural milk of their mothers, and in the quantities which they are best able to digest. In spite of the very favourable statistics and experiences in connection with the results following feeding with separated milk plus substitutes,

it is not a little surprising that milk drawn from a number of cows into a number of buckets of doubtful cleanliness by milkers of equal uncertainty, mixed, passed through a separator, augmented with so-called substitutes, measured off into so many bottles or buckets and given to the calf in bulk in two or three large feeds, can ever compete with the natural milk of the calf's mother, taken warm with the various elements in their natural and most digestible form, taken in little quantities and at times when the calf feels it wants it and can best digest it. Even when given under the best conditions and in quantities absolutely necessary this artificial method starts somewhat handicapped; but when carried on in a spirit of parsimony and carelessness, only bad results can be expected. It is for this reason that we see so many poorly developed, pot-bellied, dry-coated weedy calves. It is lamentable to think that these are really the fittest which have survived the mismanagement, starvation and neglect. How can such animals be expected to resist disease?

If by careful management and generous treatment the calf commences its life with a vigorous constitution, but, by ill-luck becomes the victim of disease, the task of combating the infection is considerably lessened. Even the man who gives the sick animals the best of nursing and dieting will be far more successful than the person who prefers to put his whole trust in drugs. Of course the former method entails far more time and trouble and is less frequently adopted. Too much belief is often placed in a drug which, like a gun in the hands of a monkey, may frequently be put to uses for which it was never intended. This has been seen in the case of Tallianine, a medicine which, because it was recommended as a valuable agent in the treatment of one specific disease of calves, has been expected to work miracles and overcome each and every calf ailment—not excepting starvation and neglect.

It is all important to detect the first cases of any infective malady so that the disease can be dealt with at the onset by isolating the sick animals and removing the healthy from the infected. The man who systematically observes his stock will at once notice any symptom of ill-health such as dullness, loss of the usual brightness and vigour, hanging behind the herd, staring coat, hanging head, drooping ears, dullness

or watery appearance of the eyes, diarrhœa or, perhaps, constipation, morbid appetite, dry muzzle or elevated temperaature (the normal temperature of a calf is a little higher than that of a grown animal). Any of these signs should serve as a warning and the suspected animal should be carefully examined, and if necessary, isolated and nursed.

For this purpose a sick-camp should be prepared well separated from the general housing and grazing ground. From this camp the animal should not be allowed to return to the herd until free from suspicion, and should be disinfected before leaving.

If fed from the mother, the cow should be taken to a place near the isolation camp and the calf be allowed to suckle there. It is as unwise to allow the cow to enter the sick camp as the calf to visit the mother in the herd.

Calf diarrhoea is a frequent cause for alarm because at first it is difficult to distinguish from specific "scour," which is infectious. When a calf is noticed to be purging all that is often necessary is to starve it for twelve hours. Some simple remedy may be given, such as peppermint water, thin gruel, chalk, or bi-carbonate of soda. In more persistent cases, one to three ounces of castor oil may be given, according to the size of the calf, and this may well contain five to ten drops of creosote mixed with it.

Dullness and loss of tone due to "red-water" may be benefitted by an occasional course of the following powder:

Methyl arsenate of soda	...	1 ounce.
Powdered nux vomica ...	...	1 ounce.
Powdered sulphate of iron	...	1 ounce.
Powdered gentian ...	...	1 ounce.

Mix to make a powder. Give a teaspoonful twice a day.

Any cough should be regarded with suspicion because it may indicate the onset of the specific lung disease of calves, which causes such alarming mortality in this country. Where there is reason to suspect this fatal malady it may be wise to destroy the first infected calves before they can contaminate the others. Careful search should be made as to the source of their infection, and measures taken to deal with it. If, however, the calves are in good general condition and are kept under good sanitary conditions, this disease, like most others, loses half its terrors.

A Note on Malaria.

By A. M. FLEMING, C.M.G., M.B., F.R.C.S. (Edin.), D.Ph. (Camb.).

The approach of the rainy season with the consequent increase in the numbers of insect pests and especially the Anopheles mosquito, makes incumbent on all settlers and farmers to set their house in order and to guard themselves and their families, so that they may as far as possible avoid malarial infection.

It is folly to suppose that because no mosquitos are noticed they are necessarily absent altogether. One is so frequently told, "Oh, we dont need to use a mosquitc net; we have no mosquitos here." And yet a systematic search will in nine cases out of ten produce mosquitos or their larvæ, and, in these cases, most often Anopheles.

The common domestic mosquito, the Culex, which is harmless as far as malaria is concerned, is more pertinacious and unpleasant than his harmful brother, the Anopheles, and when he is absent, as is not infrequent in many parts of the country, the individual is apt to delude himself that he is secure, and to scorn precautions. In fact the advent of the Culex is often a blessing in disguise, forcing the settler to take precautions for his comfort which he would not otherwise take for his safety.

From December on, persons in malarious districts should commence also the practice of taking prophylactic doses of quinine. Precautions for the prevention of malaria and instructions as to its treatment have been issued in pamphlet form by the Government. These have been sent to most of the farmers and settlers, but those who have not received them or desire fresh copies cae get them at any time on application to the Agricultural Department, the Medical Director's Office, or the Estates Department.

The Ground-Nut or Pea-Nut.

(Arachis hypogæa.)

Its Cultivation, Uses and Markets.

By H. Godfrey Mundy, Agriculturalist and Botanist.

In past years there has been an unfortunate prejudice in South Africa against those crops commonly grown by natives, and it is not until the value of these crops comes more fully to be realised that their cultivation by "whites" becomes at all general. We need not go back very far to arrive at a time when maize was considered anything but a white man's crop. In the early days of Rhodesia no one thought of growing maize—it was considered sufficient to trade it with the Kaffirs. In pre-war days in the Transvaal the majority of farmers looked upon maize as a crop entirely beneath their notice, yet at the present time the tendency throughout South Africa is to give pre-eminence to maize-growing as the surest way of retaining and bringing money for agricultural produce into the country.

It is not intended to infer by these remarks that the growing of ground-nuts is ever likely to be carried on to the same extent as will be the production of maize, but the fact remains that there are large local markets which are very inadequately supplied, and that the European demand appears to be steadily increasing. Moreover, there are in Southern Rhodesia large areas of poor, sandy soil, unsuitable for the production of most crops, yet which, if planted with ground-nuts, should give profitable returns, and which at the same time, might be so improved that the growing of other and grosser feeding plants, such as maize, potatoes, sweet potatoes and the like might be made possible.

Description and History.

The ground-nut is known under several common aliases: Pea-nut, Ground-nut, Pistache-de-terre, Goober, Pindar, Arachide, Monkey-nut, Earth-nut and Ground-pea, of which the three first-named are the most common, though strictly speaking the name Ground-pea is the most descriptive.

Botanically known as *Arachis hypogœa*, this plant is, according to most modern writers, a native of Brazil. It belongs to a genus having six other species, all indigenous to that country, and although never reported as being met with in a wild state, it is probable that *Arachis hypogœa* may also be regarded as indigenous to South America.

Ground-nuts have long been cultivated by the native tribes of Africa, and form amongst them a very favourite article of diet. From a practical point of view it is of little importance whether the plant originates in Africa or South America, but as previously stated the balance of opinion is in favour of Brazilian origin, and its introduction into tropical Africa is ascribed to the influence of the Portngese as a means of supplying food for slaves on their transit from Africa to America.

BOTANICAL DESCRIPTION.

Arachis hypogaea is botanically described as a diffuse herbaceous annual with upright trailing, straggly branches, rarely if ever exceeding one or two feet in height. Stems thick, angular, more or less hairy and pale green in colour, branches spreading, leaves trifoliate with small yellowish flowers borne in the axils, and having the peculiar habit of maturing its fruit beneath the ground.

In this respect it resembles the ground bean or Bambarra ground nut (Voandzeia Subeterranea) also a crop much much cultivated by the natives of tropical and sub-tropical Africa, and with which it must not be confused. The blossom forms at the end of a pedicel-like calyx tube, at the base of which is the ovary. After the flower has "set" the peduncle or "spike," i.e., flower stalk, elongates, and bending downwards pushes itself beneath the surface of the soil where the young seed pod matures and ripens. The seed envelope or pod is of a papery character veined with net work and takes its colour largely from that of the soil in which it is grown. The pods are often slightly curved and contracted in the middle and bear from one to three seeds of varying size and shape, The seed is covered by a thin skin (testa) ranging in colour from pale yellowish brown to bright red. It may be here noted that should the flower, after

setting, be unabe to thrust itself beneath the soil, it withers and in the course of a few hours dies—thus forming no seed.

THE GROUND-NUT—A LEGUIMINOUS CROP.

Arachis hypogaea belongs to the great order of the Leguminosae, and in common with other leguminous plants has the power of taking in free nitrogen from the air and storing it in the roots. On the roots of a pea-nut plant grown under favourable conditions large numbers of warts or nitrogenous nodules may be found within which with the help of a good microscope may be seen myriads of small nitrogen gathering bacteria. The theory of the symbiotic relationship of nitrogenous bacteria to leguminous plants is now fairly widely understood and it is not necessary to go into further details here.

VARIETIES.

Ground-Guts may be fairly divided into two varieties or more properly, types, the one where the vines are more or less erect, being termed bunch or bush varieties, while those with prostrate or semi-prostrate stems are designated by the term "running." The Spanish is an example of the bunch type, while the local or Kafir variety is usually a runner. The Virginia running variety is one of the most common, but the Virginia Bunch when introduced into South Africa some few years ago appeared in many respects the best nut so far tested and was proved in almost every respect superior to the Kafir nut, though careful observation indicates that the type of this variety does not always remain true and often from an apparently pure seed of Virginia Bunch the resulting crop will show both bunch and running character. Whether this is due to influence of climate or to cross hybridisation is not clear, but where it occurs the process of harvesting becomes far more arduous. In all countries where ground nuts are grown local names for certain varieties have been adopted such as Malay White and Malay Brown, Georgia Red and Tenessee Red. Many of these are probably very similar and up to the present those which have been most carefully tested in South Africa are the Virginian Bunch, Mauritius, Brazilian and of course the local Kafir variety. Of these the Brazilian and Mauritius do

not appear well suited, while the Virginian Bunch has in almost all respects proved superior to the local kinds and has the further advantage of maturing about three weeks earlier and of producing a large, well filled, nice coloured nut eminently calculated to meet with favour for human consumption.

In bunch varieties the nuts are borne in dense clusters around the main stem whereas the running types bear pods almost over the entire length of the vines. It will be readily understood that harvesting is less laborious than with the latter kinds. The Virginian bunch has a further advantage in that the peduncles are tough and the nuts in harvesting do not readily break away from the stem.

CLIMATE.

The ground nut requires a moderate but not an excessively warm climate. A growing period of five to six months with freedom from frosts is absolutely necessary. As a general rule it may be said that ground nuts can be grown wherever the climate is suitable for maize production and with more certainty where citrus fruits can be grown successfully. The crop seldom suffers from drought and excellent returns have been obtained in the Transvaal middle-veld and bush-veld where the conditions of climate are very similar to those obtaining in the dryer parts of Southern Rhodesia.

SOIL.

The most favourable soils are those of a light, well drained loamy character. The presence of a fair percentage of lime is desirable, but in this country it does not appear absolutely necessary. Good crops are often reported from earth wanting in this plant-food. It is not uncommon in South Africa to find lucerne growing luxuriantly on soil which in other countries would be considered lacking in sufficient lime, and the same may be the case with ground nuts. Heavy, water-logged or clayey soils are to be avoided, as on such the cost of cultivation and harvesting is greater while there is a liability of a large percentage of the nuts rotting; moreover, such soils are, when properly worked, of good fertility, and

can be used to better purpose for other crops. As far as Southern Rhodesia is concerned the ground nut is essentially a crop for light sandy soils, since the plant, being a leguminous one, is able to draw upon the atmosphere for a large part of the nitrogen which it requires, and by so doing not only assists its own growth but also tends to enrich the loam on which it is grown. Such sandy soils react very readily to a small application of kraal manure, and it seems not unlikely that were ground nuts grown for two or three years in succession, and followed by maize, a good crop of the latter might be expected. Further experiments are needed to settle this point, but the suggestion is put forward to those who contemplate growing ground nuts.

PREPARATION OF SOIL.

Sandy soils are notoriously easy to work, and beyond ploughing the land and working it to a good tilth no special preparation is required. Deep ploughing is not essential, six to eight inches usually being found ample. The two most important points to be attended to are: (1) the ground must be thoroughly clean and free from weeds, since during much of the time the crop is in the ground cultivation is impossible; (2) the surface soil must be well worked and kept loose, otherwise the flower stalks, after the flowers drop, are unable to enter the soil and so to mature seed.

SELECTION OF SEED AND SOWING.

With this crop careful selection of seed is most important and greatly influences the resulting yield. Large well-filled pods (containing two to three seeds) should be chosen and these should be thoroughly dry and free from mould. Where the Virginia Bunch is grown and where the two types make their appearance it will be well to select seed from those plants showing the upright habit of growth.

There are three methods of sowing: (1) whole unbroken pods, (2) cracked pods, (3) shelled seed. In the latter case care must be taken that the thin papery skin covering the seed is not broken. In South Africa the first method does not usually prove satisfactory, probably owing to lack of sufficient moisture to soften and decompose the shell.

The best results seem to be obtained when shelled seed is used, given favourable conditions at the time of sowing. So far machinery has been very little used in South Africa for dealing with the ground-nut crop, and hand labour is usually resorted to. Further reference to this is made later. Distance of sowing depends upon the variety grown. For running kinds the rows may be 3 to 3½ feet apart, the plants 14 to 24 inches apart in the rows; while for those of the bunch type rows 30 inches apart and plants 14 to 18 inches distant in the rows appears sufficient on most soils. No hard and fast rule can, however, be given as the fertility of the soil must necessarily be an influencing factor.

Since the spacing of the crop varies the amount of seed required per acre will do so also. As a general rule the amount of unshelled seed needed will not exceed 35 to 40 lbs. per acre. Two seeds are usually dropped to each hill, or where crushed pods are used, the two halves of the pod.

AFTER CULTIVATION.

The object of this, as before indicated, is twofold; first, to keep down weeds which if allowed to establish themselves rapidly outgrow the ground-nut plant in its early stages, and so overshadow it that the yield is materially lessened; secondly, to retain the surface soil in loose and open condition. Cultivation by means of an horse hoe is advisable, but the ordinary weeder can also be frequently used with good results, care being taken, however, that cultivation ceases as soon as it is seen that the flowers are being knocked off or the young pods uprooted. Opinion is divided as to the advantages of hilling up the crop as it approaches the time of flowering, but until definitely proved to the contrary we are inclined to believe that a slight ridging up is advantageous to the formation of seed and also for draining the rows.

HARVESTING.

As already stated the Ground-nut requires about five months to mature seed, and it is important that harvesting should commence before the advent of frosts. If this is neglected the quality of the nuts is often impaired, and the yield of haulm or vine will be greatly lessened owing to to the fact

that the leaves and stems become brittle and break off during the process of reaping. The crop does not ripen very eveely, and if left too long a certain proportion of the earlier maturing nuts may crack a sprout. Experience must be the main guide, but in normal seasons a slight yellowing of the vines will indicate that the time to commence harvesting is approaching.

Harvesting Ground-nuts by hand is a laborious and costly process, and it is largely on this account that the cultivation of this crop in South Africa has not been more general. The usual process is to send boys along the rows loosening the plants in the soil with forks, other boys following pull up the plants and, after shaking the adhering soil from the roots, throw them into heaps or windrows, where they are allowed to dry. Instead of loosening by hand a small single-furrow turning plough can be used, and when small areas only are under cultivation, this is probably the cheapest method. For large areas a ground-nut digger is to be recommended.

In the United States and other countries where rain may be expected after reaping, precautions are taken to keep the heaps dry, but in most parts of South Africa dry weather for harvesting can be relied upon, and such precautions are not necessary. It is advisable, however, to plant upright poles at intervals through the field, and at the base of these to place a layer of thorn or brushwood. After the nuts have remained in the windrows for a few days they are collected and piled on the brushwood platform around these poles, and if not in danger from white ants or field mice, they can remain there and be threshed at leisure.

Under present conditions threshing usually consists of beating off the nuts from the vines by hand. Unless thoroughly dry when threshed there is some danger of the nuts heating, so that care must be exercised in this respect. After threshing the nuts can either be bagged or shelled by hand or machinery, and marketed as shelled nuts. If thoroughly dry when bagged and if stored in a dry place the nuts can be kept for many months without injury.

YIELD.

Returns per acre must necessarily vary according to the treatment the crop receives, the climate and the variety

grown. In the United States of America the average yield runs from 17 to 30 bushels per acre (bushel 22 lbs.). Fifty and sixty bushels are often obtained while some states crops running as high as 100—120 bushels are recorded. No returns are at present available from Rhodesia but in the Transvaal yields ranging from 1,000 to 1,500 lbs. (50 to 75 bushels) per acre have been reported from soils of only moderate fertility.

GROUND NUT MACHINERY.

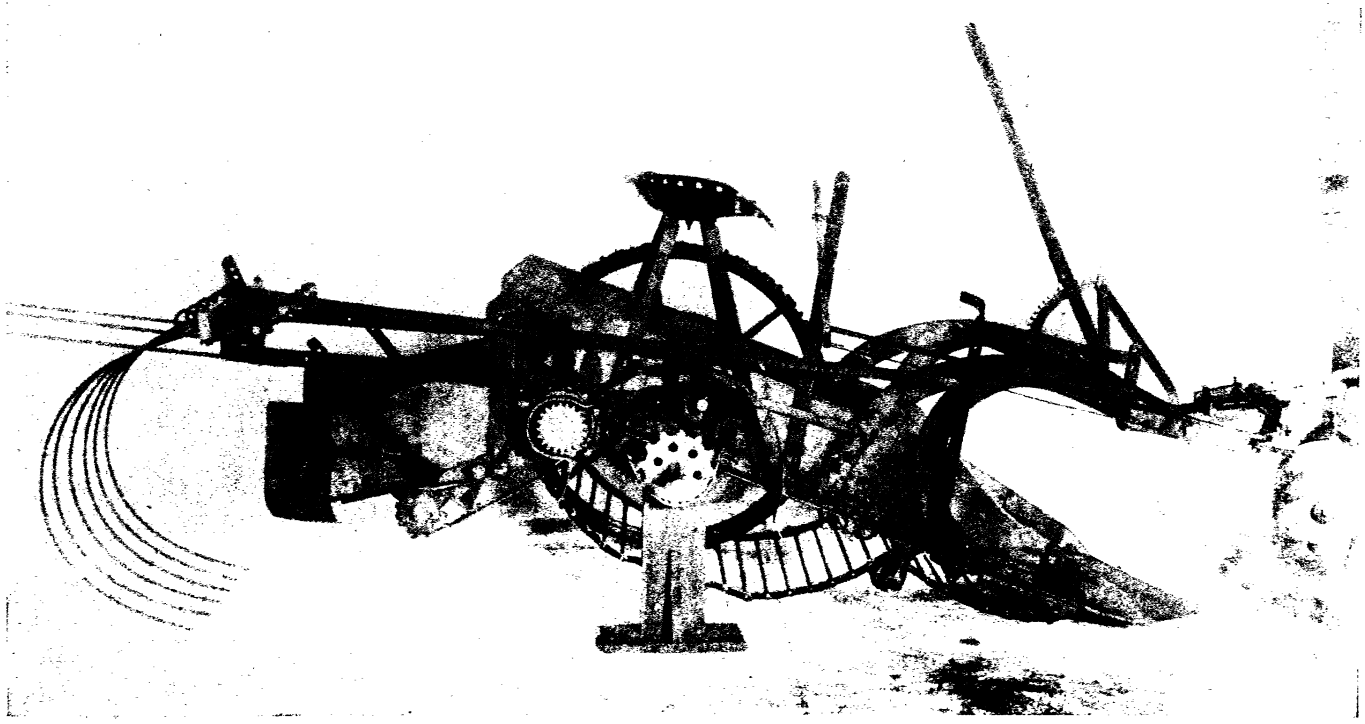
It is only within recent years that much attention has been paid to the manufacture of machinery for dealing with this crop. Many of the machines advertised are not satisfactory but among many a few seem promising.

PLANTERS.

Unless a planter is used the work must be done by hand—which entails marking off the rows at the correct distance apart and also marking at equal intervals the spots where the seed is to be dropped. An illustration is given of a ground nut planter now in use in the United States of America. The working of the machine is evidently simple and needs little comment. One strong mule would probably draw this planter with ease and about the same area should be planted as with a single row mealie planter. The price of these planters in the United States of America is about £3 to £4.

HARVESTING MACHINERY.

The ordinary turning plough can be used as a substitute for hand labour in loosening the crop in the ground preparatory to gathering it. The general aim of a ground nut harvester is to sever the tap root of the plant and at the same time to loosen the soil around the lateral rootlets. The "Rice" pea nut harvester, as illustrated, will be seen to resemble in many respects a potato digger. The tap root is cut by the pointless shear and as the machine is drawn along the plants with some soil are lifted out of the ground and pass over an endless chain formed of steel bars. Here the adhering soil is knocked off and the vines are held in a crib at the rear of the machine. As with a hay rake this can be lifted at intervals



"Rice" Pea-Nut Harvester

and the plants dropped out in small heaps. When running varieties are grown two cutting discs can take the place of the fore carriage wheels and these sever the vines mid way on either side. The cost of this machine landed in Rhodesia will be about £25 and it is estimated to harvest about eight to ten acres a day.

SHELLERS.

There are several shellers on the market costing about £12 in South Africa. All varieties of ground nuts do not however shell equally well and we have not yet had an opportunity of seeing one of these machines working.

USES OF THE GROUND NUT AND MARKET PRICES.

As far as the nut is concerned there are two main uses; *(a)* for human consumption in the form of roasted dessert nuts or as sweetmeats and confectionaries, for which purpose the large white kernelled, red hulled nut is preferred; *(b)* for oil, for which purpose the smaller nut, poorer in appearance, is used. The use of ground nuts in confectionery is far more general than is commonly known and large quantities of high grade nuts are imported annually into South Africa for this purpose. It is interesting to note that largely through the efforts of the South African National Union the sale of roasten ground nuts in the streets of Cape Town appears to be making a steady advance, and the people of the Sub-Continent seem in a fair way to become as addicted to eating ground nuts as the inhabitants of some of the States of America.

The present price of imported nuts for human consumption is stated on good authority to be from 18s. to 20s. per 100 lbs. The Natal nut realises about 8s. to 10s. per 100 lbs., and the Rhodesian grown article will fetch about 2s. 6d. per bag more.

As an oil producer the ground nut contains about 38 to 50 per cent. of oil, depending largely on the variety grown. The higher grades or ground nut oil are used largely in the adulteration of olive oil and in the making of edible fats, while the lower grades are used in the manufacture of candles, soap, etc. Marseilles is the great centre for the production of ground nut oil and its bye-products, suppies being drawn from Africa, India and Spain. For the purposes of oil production market prices run about 8s. per 100 lbs, for

undecorticated nuts, and about 3s. to 4s. higher for shelled nuts with an oil content of about 46 to 48 per cent.

As far as we are aware there is no oil mill operating with ground nuts in Southern Rhodesia, but in Johannesburg the New Chemical Company is taking up work along these lines, and the first season's results are said to be highly encouraging.

LOCAL MARKETS.

Few people realise how largely the Ground-Nut has become an article of human diet and, leaving aside the demand for seed for oil mills, we are informed that Capetown alone consumes about 3,000 bags (100lb each) per annum, and Johanesburg about double this quantity. The total amount of Ground-Nuts annually imported into South Africa for use in the Transvaal, Cape Colony and Natal is stated to be roughly about 800,000lbs (400 tons Colonial), and at an average price of say 12s. 6d. per bag, worth £4,500. This moreover in addition to the no inconsiderable quantity of nuts at present produced in the country. In Southern Rhodesia we have excellent local markets on the mines where Ground Nuts are at present in large demand and where there seems every prospect of their use becoming more general. The fact that present prices run from 1½d to 2d per pound indicates that the supply is not equal to the demand.

EUROPEAN MARKETS.

The following report on the present position of the ground nut market has been received by one of the principal firms in London dealing with this product:—

"There is no difficulty in selling ground-nuts in this country, provided they are shipped in quantities of not less than fifty tons. There is no market for unshelled nuts, and it is of the utmost importance that the nuts reach this country in a thoroughly sound condition. The current market price is about £13 10s. per English ton (approximately 12s. per 100 lbs.). As a rule ground-nuts are packed in bags of about one and a quarter hundredweights.

"It is important to notice that unshelled nuts are absolutely useless here. Large quantities of ground-nuts are sold at Marseilles, but the prices realised there would be practically the same as the market prices in London."

It will be seen therefore that for the European market shelled nuts are necessary, while for human consumption in South Africa unshelled nuts are required. Where oil mills are in operation a higher price is usually paid for shelled nuts.

AMERICAN SUPPLIES.

In America this crop is known as the pea-nut, and is grown in commercial quantities in eight states, but of the total output it is estimated that Virginia and North Carolina produce one half. The 1905 crop was estimated at 14,000,000 bushels, of which the two above-named states produced 4,000,000 bushels each. The value of nuts placed on American markets, exclusive of that retained for planting and home consumption on the farm was estimated at $10,500,000.

In spite of so large a home production, the United States yet requires to import pea-nuts—the importation through Atlantic ports in 1904 amounted in value to $65.161, supplies being chiefly drawn from Spain, while the Pacific ports imported to the value of $87,441, mainly from Japan and China. At the time these statistics were given, no pea-nut oil mills were in operation on a commercial scale, and the supplies indicated were required for human consumption.

ADDITIONAL USES FOR THE GROUND NUT.

In connection with the production of oil the bye product of the Ground Nut forms an excellent oil cake suitable for feeding purposes.

In the United States the nuts are used very largely as a pig feed—the pigs being allowed to harvest the crop for themselves. For the production of good quality pork, a feeding ration composed solely of Ground-Nuts is not to be recommended, as the fat is said to become soft and oily, but used in conjunction with suitable starchy food such as maize, Ground Nuts will be found a profitable crop to grow for pigs. The value of the crop as a soil renovater has already been dealt with. It has still a further value, namely, in the haulm or vine, as a winter feed for stock. In order to obtain this in good condition the crop should not be allowed to dry out too completely before harvesting. The yield of haulm varies from one to three tons per acre, and in feeding value if well saved it compares quite favourably with clover hay and cow-pea hay.

From the foregoing remarks it seems not unreasonable to anticipate that the growing of ground nuts in rotation with maize and other crops might profitably be taken up on a large scale in this territory, and the fact that large oversea markets are open to us, should production exceed local demands, is an economic factor of no inconsiderable importance. The question of an export trade in this article seems one which might well be taken up by the Co-operative Societies, but for the present there is ample evidence that all available supplies will meet with a ready market within South Africa. The main point to be borne in mind however is that owing to better quality, imported nuts command higher prices and it is necessary therefore to see, whether by the introduction of improved strains Rhodesia cannot produce a nut equal in quality to that now being brought here from abroad.

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Poultry.

By PHILIP L. HALL, Lenham Farm, Syringa.

[CONTINUED.]

THE PRINCIPLES OF FEEDING.

The poor results obtained by many poultry keepers in the matter of a good and constant supply of eggs can be traced in most cases to the feeding of their birds. By feeding is not meant the regular methodical way in which foods are mixed and served, nor yet the general manner in which the various foods are selected and proportioned. I rather intend to convey by the word feeding the intelligent principle, or subtle instinct, that underlies and governs the whole process of feeding as opposed to the blind, rule of thumb, stereotyped method which all unsuccessful poultry keepers cling to with such astonishing tenacity. Many people whose duty it is to tend poultry narrow the process so down to one groove that it appears never to strike them that a fowl is higher in the scale of things than a machine, and possesses likes and dislikes the same as any other living creature. It is my intention to offer a few suggestions that may widen their ideas on this important subject. In their natural state fowls are omnivorous, devouring vegetation, seeds, and meat in the form of insects. Instinct and necessity go hand in hand at certain seasons of the year, teaching the bird what is most suitable to its circumstances. For instance, a bird will consume an amount of animal food just prior to, and during a period of laying, which she would refuse at any other time. A duck will cause havoc amongst the frog family, and worms and grubs suffer in a similar manner from the hen. The nature of the birds in both instances craves for that food which is most rich in albuminoids—meats, because to produce eggs the hen or duck must consume sufficient of that matter of which an egg is composed. But it would be courting certain disaster to always feed hens on such rich nitrogenous foods. Fowls at liberty will balance their own foods as nature dictates, but it is in the breeding pens that the poultry keeper must take care that the foods supplied will fulfil all the requirements of the birds. The

egg, after all, is to the hen as the fruit is to the tree. It can only be produced by a parent in a fit state. A hen has to maintain her own body in health and vigour first, and then produce eggs. Lost tissue must be replenished, and the heat of the body that is essential to life must be constantly sustained. Every keeper of poultry should know that foods are divided into certain classes, viz., (1) nitrogenous or albuminous; the most important, and mainly useful in the formation of flesh and in the production of eggs; (2), carbonaceous foods, rich in starch, sugar or oil, wanting in nitrogen, and mainly instrumental in supplying fuel for the combustion that takes place in the body, or, in other words, providing fatty matter and producing heat; (3), mineral substances, such as lime, iron and phosphorus, which are essential in the formation of blood, bone, feathers, and egg-shells, and in helping digestion; and lastly there is water, of which by far the largest portion of the body is formed. The poultry keeper with a knowledge of these four classes of foods, and the help of a table of analysis pointing out the proportions in which they exist in the various grains and meals, etc., will not only be able to exercise greater economy in feeding, but he will find that he can give the fowls a diet exactly suitable to their requirements. He can thereby ensure a good supply of eggs even from birds in very narrow confinement. The evils of feather-eating and the other vices and diseases, that birds kept under these conditions and improperly fed are prone to, can be largely prevented by judicious feeding. We unconsciously adopt certain rules in the feeding of ourselves, and if the same were followed with regard to fowls beneficial results would be obtained. We do not eat fat or oily foods in summer, on the contrary, a fruit and vegetable diet appeals to us most. The dwellers in very cold regions exist on little else than blubber and oily matter owing to the intense cold, but on the other hand the native of India does very well on a very little rice and some fruit. The cow in milk not only requires more food than one that is not in profit, but she requires nitrogenous and fat forming materials to enable her to produce milk. So in the case of poultry, if the feeder gives their particular requirements a thought, compares them with his own wants or those of other stock, and takes into account the state of weather or climate to which the birds are subjected, he may without any difficulty

select those foods most suitable to the circumstances. Meat and green bones are two forms of nitrogenous diet, neither of which is used nearly enough. There are no better foods for layers than these, and as I have already pointed out, a hen in full lay comparatively speaking requires a great deal. Such a bird will eat one and a half ounces of green bone per day without becoming overheated or plethoric. Cut bone has a great tendency to increase the size of the egg produced as well as stimulating the egg organs. Beans and peas are very rich in nitrogenous matter, and are consequently a most valuable food for laying hens and where any form of meat is unprocurable either of these foods will be found a good substitute, but care must be exercised in their use. For instance, to give a large quantity of either bean or pea meal to hens that are not laying would be absolutely injurious.

Temperatures Recorded, 1909

(MEANS).

	July.		August.		September.		October.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Bulawayo	69.9	45.5	78.5	47.2	79.2	53.4	83.9	58.1
Chishawasha ...	72.7	42.2	78.6	42.9	79.4	49.9	87.9	53.6
Gwelo	69.6	40.8	77.9	42.8	78.7	49.8	83.7	55.9
Hope Fountain ...	68.8	34.4	78.3	47.5	74.4	52.0	84.4	57.1
Melsetter	62.2	...	71.3	...	72.7	...	76.4	...
Plumtree	68.2	46.9	70.6	46.2	77.3	53.3	...	...
Salisbury	70.4	40.3	76.8	45.9	78.0	52.6	82.1	57.0
Umtali	79.5	29.9	77.3	33.7	81.1	35.0	84.9	36.8
Belingwe	...	...	76.4	45.5	...	...	84.9	60.3
Gwanda	71.8	44.5	80.1	48.2	81.4	55.6	87.1	60.4
Rhodes Matopo Pk.	70.1	43.1	78.5	47.8	80.5	54.0	...	...
Victoria	69.8	41.3	78.6	42.9	...	...	...	...
Inyanga	65.7	40.8	72.4	42.5	72.9	47.2	74.6	50.1
Empandeni	72.5	41.1	80.6	44.3	83.0	51.8	85.9	57.3

Records received of Rainfall at Stations in Southern Rhodesia, 1909.

	July.	Aug.	Sept.	Oct.
MASHONALAND—				
Brundrett	...	...	.48	1.21
Charter (Range)	.16	...	.12	.98
Chilimanzi	...	...	.25	.38
Chishawasha	...	...	.46	1.30
Enkeldoorn	.08	...	.04	1.68
Eagle's Nest	.01	...	.68	2.06
Gatooma	...	...	.14	.71
Gutu	.15	...	.08	.01
Helvetia	1.26	1.19	.93	1.35
Inyanga (B.S.A.P.)	...	...	...	2.59
Inyanga (York Farm)	.02	.01	...	4.12
Marendella	.11	...	...	.71
Macheke	...	...	...	1.21
M'Rewa	...	...	.54	...
Melsetter	1.12	...	.04	.13
Mazoe	...	...	.22	1.20
Progress Farm	...	...	.51	.98
Salisbury	...	...	.34	1.58
Sinoia	...	...	.04	.51
Summerfield	...	...	...	.55
Utopia	.45	1.00	.26	.91
Umtali	.33	.45	...	.91
Victoria	.08	...	...	...
West Ridge	...	...	.37	1.66
MATABELELAND—				
Bulawayo Observatory	...	...	.18	1.12
Bulawayo (Government House) ...	...	...	.04	.97
Belingwe	...	...	...	.98
Driefontein	.12	...	.07	.40
Empandeni	...	...	.13	2.09
Filabusi	...	...	.10	1.13
Fort Rixon	.01	...	...	.34
Gwelo	.13	...	.09	.29
Gwanda	.02	.03	.42	1.38
Hope Fountain	.08	...	.09	1.12
Inyati	...	...	...	.84
Matopo Mission	...	...	.37	...
Mshabetsi Mission	.02	.02	.26	.54
Plumtree	...	...	.11	...
Que Que	...	...	...	.70
Ringstead Reef	...	...	.08	.76
Rhodes Matopo Park	...	...	.20	...
Syringa	...	...	.11	...
Tegwani	...	...	.08	.58
Tuli	...	...	...	1.18
Umgusa	...	...	...	.62

Broomcorn.

(Andropogon Sorghum var technicus.)

By H. GODFREY MUNDY, Agriculturalist and Botanist.

At several of the Agricultural Shows held at the close of last season, exhibits of locally grown broomcorn and locally made brooms attracted no little attention. One of the most creditable exhibits was that made by the Mutambarra Mission Umtali, and it was recognised that much of the fibre was of excellent quality. It does not appear to be generally known that for several years now a broom factory has been in existence at Claremont, Cape Colony, under the supervision of Mr. E. Ingle, and that a considerable proportion of the wisp brooms used throughout South Africa, are now turned out by this factory. It is a regretable fact however that the great bulk of the raw material still needs to be imported, large supplies being received from America. Efforts have been made to establish the growing of Broomcorn as a profitable industry both in the Cape Colony, the Orange River Colony and the Transvaal, but up to the present not many growers have done more than produce a few hundred pounds weight of fibre, which some of them have converted into brooms for their own use and for sale amongst their immediate neighbours.

The action of Mr. Spear on the farm of the Mutambarra Mission, Umtali, in testing this crop and in turning out brooms of excellent quality, last year and in preparing over forty acres for the crop this season indicates that Rhodesia may also do well to give broomcorn some little attention. It is hoped that 20,000 brooms will be made at the Mission next year, and more machinery is under order. Heretofore railway rates have frequently discouraged the growing of broomcorn, being so high as to preclude any fair margin of profit being made. Present local rates are quoted below and there seems reason to hope that were the output sufficiently large, the Railways might be induced to further reduce their charges.

A sample broom manufactured at the Mutambarra Mission was forwarded to the Claremont Broom Factory for inspec-

tion, and we are indebted to Mr. Ingle for the following report:—

"We are very glad to see that Rhodesia is able to grow such a creditable specimen of Broomcorn; it certainly is not at all bad, and we could take a hundred tons per annum as per the outside coat, and could give £16 per ton for the same f.o.r. Claremont Station. The general fibre is rather coarse and the inside of the brush is very short, and for our purposes almost useless except at a very low figure. One fault in the corn is that it has been allowed to get too ripe before cutting. It should be reaped when the seed is in the milk stage and the fibre would then be much tougher and probably of a better colour."

Subsequently the Agricultural Department approached the B. & M. & R. Railway Company, and through the courtesy of the District Traffic Superintendent, Salisbury, obtained the following quotations of Railway rates *to Claremont*:—

From.	1-ton lots. per ton. £ s. d.	5-ton lots. per ton. £ s. d.	15-ton lots. per ton. £ s. d.
Umtali ...	8 16 11	4 14 4	3 12 3
Salisbury ...	7 1 1	4 7 3	3 8 8
Bulawayo ...	4 17 6	3 14 8	3 2 5

Broomcorn is by no means a difficult crop to grow, though some little knowledge is required in harvesting and curing. Most soils which will produce remunerative crops of maize will also grow broomcorn, while the latter is if anything a better drought resister. To those farmers who are now growing Kafir corn, a trial with Broomcorn should commend itself; with the former birds are always a menace, while with the latter the value of the crop lies in the fibre and not in the grain. Cultivation and methods of growing are similar to those for maize, and about four pounds of seed drilled in rows three feet apart will plant an acre. When the grain is in the milk stage, as described by Mr. Ingle, the stalks should be cut off about 4 to 6 inches below the base of the fibre and the heads can then be hung up to cure. During this time exposure to rain and weathering often seriously injures the colour of the fibre and curing sheds are therefore recommended. When completely dry the seed is threshed out and after trimming the stalks to the correct length, the heads can be baled in the same way as oat forage, with the butts outwards. Threshing is economically effected by

roughly beating the heads and afterwards drawing them through a coarse comb with either wooden or iron teeth securely fixed to a board, such as is commonly used in preparing grass for thatching purposes. After threshing the "brush" should be roughly sorted into grades.

The points which a good sample of broomcorn should present are as follows:—

LENGTH OF FIBRE should not be less than 14 inches. It usually varies from 14 inches to 24 inches and, speaking generally, the longer the better.

FINENESS OF FIBRE.—A coarse stiff fibre is for general purposes undesirable.

TOUGHNESS.—The fibre should be tough and flexible, not brittle.

COLOUR should be pale with a green tinge throughout. Purple blotches or other discolouration tend to reduce the value as in such cases the fibre does not dye a uniform tint.

LENGTH OF THE BUTT should not exceed four inches.

Whether Broomcorn will prove a profitable crop to grow on a large scale or not will depend mainly on what quality of fibre can be produced and what yield per acre is obtainable. Where heavy railway rates have to be considered it will in any case probably only pay to grow the crop on soils which will produce a good length of fibre. It is difficult to estimate the yield per acre but from trials conducted elsewhere in in South Africa, the average appears to run from 300 to 600 lbs. of clean fibre per acre. Experiments to test this point have been provided for during the coming season and the results will be published in due course.

As a guide however it may be mentioned that Mr. Spear is offering to farmers in his vicinity 1d. per pound for broomcorn with the seed, unripe of course, and 2d. per pound for cleaned broomcorn. Taking this as a fair value and 550 lbs. (clean) as the crop we have a gross return of £4 11s. 8d. per acre. As the cost of growing is much the same as for kafir corn except that the seed is sown in drills instead of broadcast every farmer should readily be able to calculate for himself the profitableness of the crop.

"Foul Brood" in Bees.

THE GOVERNMENT REGULATIONS.

By RUPERT W. JACK F.E.S. GOVERNMENT ENTOMOLOGIST

South African bee-keepers are fortunate in being free of danger from certain diseases which constitute a heavy tax on the industry in other parts of the world and in no instance is this more a subject for congratulation than in the case of the scourge known as Foul Brood. Why South Africa should be free from this disease is a mystery seeing how wide-spread it is in other continents, having found its way to such distant countries as Australia and New Zealand. We can only attribute this freedom to lucky chance, for importations of bees, honey, beeswax and other substances quite capable of carrying infection were unrestricted for many years in all parts of the sub-continent. Of late years, however, the Government of Cape Colony has imposed certain restrictions and during the past few months there has been a general movement to secure uniform legislation in this respect throughout all the colonies and states throughout South Africa and the desired result has now been secured.

Before proceeding further it is desirable to say a few words concerning the nature of the disease, against which we wish to protect ourselves. If we open a healthy bee-hive and take out a sheet of brood comb, the first thing that strikes us is the number of neatly capped cells. These contain the full-fed larvae and on being opened disclose the occupant whitish in colour and healthy-looking. A comb affected with Foul Brood, however, presents a different appearance. Some of the caps to the cells are seen to be sunken and often perforated with irregular holes. On opening these the larvae is seen to be dead and brown in colour. A sharp instrument run into it shows it to be soft and viscid in consistency and its substance adhers to the instrument and can be drawn out into a long thread from a half to a full inch in length. This ropiness is characteristic of the disease. A peculiar odour is also present, resembling that of melted glue. These symptoms are well described in that useful treatise by A. I. and

E. R. Root, the "A.B.C. of Bee Culture." These conditions are caused by the presence of a certain organism known as *Bacillus Alvei.* This disease is capable of spreading from hive to hive in the apiary, thus ruining swarm after swarm.

Such is the disease, to prevent the introduction of which into Southern Rhodesia the regulations have been framed. It only remains to explain the reasons that underlie the various restrictions embodied in these regulations.

Government Notice No. 228 of 1909 reads as follows:

Salisbury, 7th October, 1909.

WHEREAS the disease known as "foul brood" exists, or is supposed to exist, among bees in Australia, New Zealand, and the continent of America, including the West Indies, and the continent of Europe, including Great Britain and Ireland:

Now, therefore, under and by virtue of the powers vested in me by the "Injurious Substances and Animals Ordinance, 1909," I do hereby declare and make known that

1. From and after this date it shall not be lawful for any person to introduce or cause to be introduced into Southern Rhodesia, except with the written permission of the Director of Agriculture, and subject to the production, in the case of each consignment, of sworn declarations in accordance with the forms set forth in the annexures contained in the schedule hereto, as the case may require, bees, beeswax, foundation comb, honey, used beehives, or used beehive accessories or appliances, or any article or thing that has been used to contain or manipulate bees or beeswax.

2. The above prohibition shall not apply to the introduction of bees, beeswax, foundation comb, honey, used beehives or beehive accessories from any neighbouring Colony or State which shall by its own regulations have prohibited the importation of bees, beeswax, foundation comb, honey, used beehives or beehive accessories, subject to the aforesaid exemption to any neighbouring Colony or State.

3. Any bees, beeswax, foundation comb, honey, used beehives or beehive accessories unlawfully imported, or imported otherwise than in accordance with the provisions of these regulations, or found to be affected with any disease, shall be liable to immediate confiscation and destruction, or to be quarantined at the expense of the owner until, in the opinion of the Director of Agriculture, any source of danger has been removed or has disappeared.

4. Any person contravening the provisions of these regulations, or any directions or instructions given in terms of these regulations, shall be liable in respect of each offence to a fine not exceeding £100, or in default of payment thereof to imprisonment, with or without hard labour, for a period not exceeding one year.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,
For Treasurer.

SCHEDULE.

ANNEXURE "A."

Form of Declaration required to accompany Importation of Bees.

I / We do solemnly and sincerely declare that the undermentioned Bees were supplied by me / us to..... of..... on.....and that no Bee disease of any description exists on our premises or within two miles (three kilometres) thereof.

And I / we make this solemn declaration conscientiously believing the same to be true.

.....

Declared at.....this..... ...day of 19.....

Before me,

.....

Justice of the Peace
or other Officer authorised
to administer oaths.

Number of Bees referred to in this Declaration.....

ANNEXURE "B."

Form of Declaration required to accompany Importation of Beeswax.

I / We do hereby solemnly and sincerely declare that the undermentioned Beeswax supplied by me / us to.....of on.....has been melted for not less than two and a half hours, at a temperature of not less than 212 degrees Fahr., and has not subsequently been on premises, or within two miles of premises, where Bee disease of any description is known to exist.

And I / we make this solemn declaration conscientiously believing the same to be true.

.....

Declared at.....this.....day of 19.....

Before me,

.....

Justice of the Peace
or other Officer authorised
to administer oaths.

Quantity of Beeswax referred to in this Declaration

ANNEXURE "C."

Form of Declaration required to accompany Importations of Foundation Comb.

I/We.....do hereby solemnly and sincerely declare that the undermentioned Foundation Comb supplied by me/us to.....

of.....on.....has been made from Beeswax that has been melted for not less than two and a half hours, at a temperature of not less than 212 degrees Fahr., and has not subsequently been on premises, or within two miles of premises, where Bee disease of any description is known to exist.

And I/we make this solemn declaration conscientiously believing the same to be true.

.....

Declared at.....this.....day of 19.....

Before me,

.....

Justice of the Peace or other Officer authorised to administer oaths.

Quantity of Foundation Comb referred to in this Declaration.....

The introduction of queen bees, especially the Italian variety, is occasionally desirable for the purpose of improving our native swarms, which are less satisfactory in many ways, more especially on account of their temper being so uncertain, rendering it almost impossible to handle them at certain seasons of the year. There is, however, danger of introducing the disease with queen bees and on this account their introduction is only allowed under special permission from the Director of Agriculture. It may be stated that any importation of bees will be allowed only under the strictest supervision. The firm supplying must be approved by the Director of Agriculture, a signed form in terms of Annexure "A" of the regulations will be required, the whole of the packing &c. and the nucleus accompanying the queens will be destroyed and a period of quarantine in a position accessible to a qualified officer of the Department of Agriculture will be imposed. It may be stated at once that few will care to import bees under these conditions and that this is an exceedingly desirable result. Importations will be confined to keen, intelligent bee-keepers, who are anxious to improve their stock and willing to put themselves to considerable trouble in order to enable them to do so and to safeguard

themselves and the country against the introduction of foul brood. They will naturally take the greatest care of their bees during the period of quarantine, so that the chances of the new hives being robbed will be reduced to a minimum. It is the robbery of the weakened hives by other bees that plays a large part in spreading "Foul Brood" from hive to hive. By these restrictions it is considered that the danger of introducing the disease through the agency of bees is practically eliminated.

Beeswax collected and prepared in the common way might carry infection and so might Comb Foundation, the danger being greater with the latter as it is intended expressly for introduction into the beehive. With regard to Annexures "B" and "C" of the regulations setting forth forms to accompany importation of Beeswax and Foundation Comb respectively, it is necessary to state that the spores if *Bacillus alvei* are excessively tough and experiments have shown that they are capable of resisting an exposure to the temperature of boiling water (212 deg. F.) for an hour with moderate success, while instances have been known of spores germinating after a similar exposure for a period of two hours, though this is exceptional. Two and a half hours is considered a safe minimum.

We now come to the question of honey, which constitutes the most lively source of danger, being exceedingly attractive to foraging bees and thus sure to be carried to the hives in some quantity from discarded tins and bottles and from other sources. It is the opinion of the Department that it is impossible to ensure that honey is free from infection and, as sterilization is impracticable, no permits will be issued for the importation of honey from any country in which Foul Brood is known to exist. As the other South African States have adopted a similar policy, it follows practically that South Africa must produce all the honey to be consumed within her borders.

The remainder of the regulations refers to articles which might bring the spores of the disease with them on account of having been in contact with diseased bees. It is obvious to all that the importation of such is undesirable.

Such then are the regulations and such is the outline of the Government's policy in regard to this administration. These measures it is believed will have the unhesitating support of all bee-keepers in South Africa and of all who have the welfare of this industry at heart.

Farms and Farming in Rhodesia.

THE BULALIMA—MANGWE DISTRICT.

By ERIC A. NOBBS, Ph.D., B.Sc.

The new comer to Rhodesia enters the country between Ramaquaban and Plumtree stations, and it is not long before the change in the character of the country as seen from the train is noticed. It is a rather unfortunate fact that this first impression should be somewhat misleading, for as is so often the case with South African railways the route is laid along the watershed, giving in consequence a false idea of absence of rivers and of lack of cultivable land. The homesteads and arable patches are not seen or only discerned in glimpses through the screen of low scrub which clings to the track. It is not to be denied that the district is dry in comparison to others and that it is essentially pastoral, yet on the other hand closer inspection would bring to light numerous instances of cultivation and creditable fields of mealies, barley potatoes and beans, and promising gardens, orchards and plantantations. From the high ridge, the watershed of the country along which the line runs, the District of Bulalima—Mangwe runs north-west & south-east for a hundred miles each way extending on both hands into great empty spaces seldom traversed and but sparsely occupied by natives, stretching on the one side to the Bechuanaland Protectorate border, the Gwaai Reserves and the Wankies District, on the other to the Ramaquaban and Shashi rivers on the borders of the Tati Concession. This great expanse has yet to occupied and is meantime the haunt of big game and wild dogs, cheetah leopard and lion, and consists largely though by no means entirely of bushveld, mopani being the prevailing species. Settlement has so far chiefly clustered along the railway line though outlying farms are now being taken up.

Meteorological records in the district under these circumstances are necessarily few, but the Native Commissioner at Tegwani and the Rev. Father A. Leboeuf, S.J., of the Empandine Mission keep records from which the following

notes are derived. The prevailing wind is easterly; and the rainy season lasts from about the end of September to April very little rain falling in May, June, July, August and September. The mean rainfall recorded over eight years at Empandine is 23.36 inches falling on 49 days, while at Tegwani it is 19.28 inches also on the same number of days. Empandine is 3,300 and Tegwani 4,560 feet above sea level. The following table is of interest giving the rainfall covering five years, ended 31st December, 1907:—

	1903	1904	1905	1906	1907
Empandine—					
Amount in inches ...	20.16	20.03	15.05	33.41	18.5
Days	53	38	32	72	49
Tegwani—					
Amount in inches ...	19.25	18.95	10.51	29.56	23.39
Days	52	42	30	57	51

The following figures are taken from the 1908 returns at Empandine.

Temperatures on Stevenson Screen:—

Mean Maximum	78.6° F
Mean Minimum	54.5° F
Mean Monthly Temperature ...	66.5° F
Absolute Maximum	94.5° F
Absolute Minimum	37.0° F
The Relative Humidity (Saturation)	52

There are, according to the records of the Department, some 68 occupied farms in the district, and this number may be taken as approximately correct, being recently compiled. Newcomers are from time to time taking up farms, but it is also a noteworthy fact that lately several farmers have disposed of their improved properties and gone further up, to repeat the process of taming the wilderness. The farmers of Bulalima meet together at two centres, Plumtree and Figtree, to discuss matters of moment and to make their views known through the medium of Farmers' Associations. The dates of these meetings will be found on another page.

In a pastoral district such as this the want of labour does not press so heavily as elsewhere, yet the need is often felt,

especially by those who seek to raise crops of potatoes or beans and do some market gardening, and especially by the tobacco growers.

The region is almost exclusively granitic, the soils being correspondingly formed of sand of varying degrees of fineness, looser and poorer on the ridges, more compact, damper, deeper and richer in the hollows, where a certain amount of vegetable mould has gathered to improve it. To the western side red shales occur in small amounts, giving rise to a darker and generally more fertile soil, but these areas are of limited extent.

The scarcity of water restricts cropping to the rainy season, but the nearness to the main trunk line and the market of Bulawayo renders the culture of certain crops profitable so that more attention is paid to this side of the farming industry than otherwise would be the case. At Plumtree station the traveller finds the first signs of progress, the proof of a fixed and thriving commmnity, in the form of a flourishing boarding school attended by some eighty pupils coming largely from the farms in the vicinity, although on account of its great reputation scholars are also drawn to Plumtree from a very wide radius. Leaving the railway at Plumtree one of the first farms on the southern side of the line is Highfield, the home of Mr. Cornelius van Rooyen, who besides being a farmer is a mighty hunter of big game and knew Rhodesia long before it received its name. Here besides a considerable herd of cattle the visitor may see a troop of half tame sable antelope of which a closer inspection can be obtained than is generally the case with these beautiful creatures. The farms along the line, as their names imply, Highfield, Coldridge and Watershed, are amongst the highest lying in Matabeleland, the railway attaining at this point to 4,800 feet above the sea level and are bare and exposed in consequence. At Zareba further on Mr. Pike is making a determined effort to produce castor oil on a commercial scale. He has some 45 acres planted out from which the first returns may shortly be expected. Great credit is due to Mr. Pike for this experiment, which will no doubt be watched by others who, should it prove remunerative, will gladly follow where the way has been shown. Large quantities of castor oil are used on our railways and for lubricating machinery.

Although the plant grows wild throughout South Africa it is a somewhat remarkable fact that we continue to draw our supplies from India and it would be a great matter if Mr. Pike can both grow the crop and extract the oil profitably on the spot. Near by on the farm Lenham Mr. Philip Hall is specialising in poultry exclusively and on up-to-date lines, having imported largely from the best English strains. Readers of the *Journal* are familiar with Mr. Hall's writings in the very interesting series of articles which he is at present contributing to its pages on subjects connected with poultry.

As is usual in a granite country, opportunities for storing water are rather infrequent in the district, but serviceable dams have been made on the farms Kensington and Lydeard, the latter 400 yards long and throwing the water back for some 1,200 yards and no doubt in time others will be constructed. In a pastorial district like this provision of drinking water at convenient points all over the farm is a matter of the first importance, for though water is abundant during and after the rains yet in the granite it is scarce precisely when the herbage is dry and least plentiful and when stock are poor. The remedy lies, as was pointed out by Mr. H. M. Oakley in the October number of the *Journal* in the conservation of the surface water to the utmost, not in deep borings into undecomposed granite, in dams and wells and in preserving springs, and in developing and protecting the "M'seynas," in laying in, as some are doing, stocks of succulent silage and in the cultivation of winter forage, oats and barley chiefly on those curious patches of damp soil which one finds on the slopes of the hills, often below a belt of mopani or other trees where owing to natural conservation of moisture and gradual soakage there is enough moisture to serve a green crop without rainfall.

A striking instance of intensive farming, that is of the turning to the utmost account a certain area of ground and expending much capital per acre upon it, is to be seen near Syringa, where Mr. Paterson is growing vegetables for distant markets and sending stuff away to Kimberley and Bulawayo. This is, however, an exceptional case, the average farmers are devoting all their energies to mealies and stock, and most to the latter. Cattle do well, are healthy,



Photo by] [J. S. Loosley



Photo by [J. S. Loosley

A Typical Stock Farming Scene.—Branding Cattle

grow out to a good size, and multiply rapidly; indeed, the sales at Plumtree are a recognised mart for good stock. On such a high lying exposed region however the cold dry season is severely felt, and stock is often sent elsewhere to winter, otherwise it is apt to fall off very much in condition.

Another farm on the south side of the line is of exceptional interest. Sandown, or more properly speaking, Edenvale Stretton and Wilton, is the property of Messrs. Cooper & Nephews, the world renowned manufacturers of sheep dip and cattle dip. The farm is now under the management of Mr. Hargreaves, and besides ordinary farming operations, a certain amount of work of an experimental nature has been carried on, as might in the circumstances be anticipated.

Over 40 acres of velvet beans were grown last season and manna hay has done well, though lucerne, as was to be anticipated, is not a success. A superior homestead has been erected, and what may truly be described as the finest cattle dipping tank in Rhodesia 7 feet 6 inches deep and 70 feet long over all, with a 50 feet swim and a long straight drying race in place of the usual and less effective pen; it is certainly a model of perfection. Numbers of heifers have been introduced from the Bedford and Cradock districts of Cape Colony, which, with superior bulls, should prove a benefit both to their owners and the district. A boar of the large black breed, an exceptionally good one, was also seen here. Hay has been systematically cut and made here for years past, with the most satisfactory results. At Figtree, close to the identical tree which gave its name to the place and was a landmark to the early travellers in the time of Lobengula, is the home of Mr. Montgomery, whose herds of cattle, largely Afrikander, graze on several farmt in the Mopani Veld far to the south.

To the north of the line, near Figtree Station, on the farm Maritzburg, Mr. W. F. White is farming very successfully since 1895 with cattle and, marvellous to relate, with horses, which as a rule are such a questionable venture on account of horse-sickness. About half the foals reach maturity, which is a large percentage for this country. Mr. White runs a large herd of cattle, including particularly good Afrikanders, of which young bulls are from time available

for disposal. Beyond this lie the Centenary Mission of the L.M.S. and that of the Seventh Day Adventists. In this part there are several newcomers, as on Tweeddale, Woodleigh, and several new farms to the west are in process of being taken up. Throughout this area the same conditions prevail as elsewhere in the district. Cattle are the mainstay but most farms have their quota of mealie lands, vegetable garden and fruit orchard, especially oranges and bananas. The chief needs are storage of water and provision of hay or other feed for winter.

On the farm Retreat, at Tegwani, the cultivation of Turkish tobacco is being actively and successfully pursued. The sun or air-curing mothod of drying is followed, the same as that practised in Turkey, and we give illustrations of the curing racks and of the shed erected at one end into which the leaf can be rapidly collected should an unfavourable change in the weather suddenly arise to interfere with the process. Turkish tobacco is also being grown with success by Mr. O'Brien at Tjankma, and Mr. Barclay at Redhill. The farm Tjompani also grows Turkish Tobacco of good quality. Redhill is a farm of exceptional interest on account of the good work that has been done on it since it was first taken up in 1904. Besides the tobacco and mixed farming, dairying is here a feature, the main difficulty in connection with which is the provision of fresh food throughout the dry months. Green barley is grown in the manner previously described, and exceptionally fine hay is made on old lands previously under mealies, not merely mown veld as is generally the case. The White Leghorn fowl is giving much satisfaction. An interesting experiment has been made here and loofah, that curious gourd, the fibres of which are commonly used as a substitute for a sponge, has been proved to grow to perfection. Specimens grown at Redhill are shown in the accompanying illustration; one in its nutal state, one cut, and one peeled to show the spongy tissue. Shelter belts of various gums and of beef wood are springing up, giving a home-like and well cared for appearance to the farmstead, itself rendered picturesque by the presence close to the dwelling house of an ancient wild fig, whose dark, dense foliage and wide spreading limbs cast a grateful umbrageous shade from the glowing sun. Mr. Fath at Maakwa, in this vicinity, is the possessor of a remarkably



Photo by] [J. S. Loosley

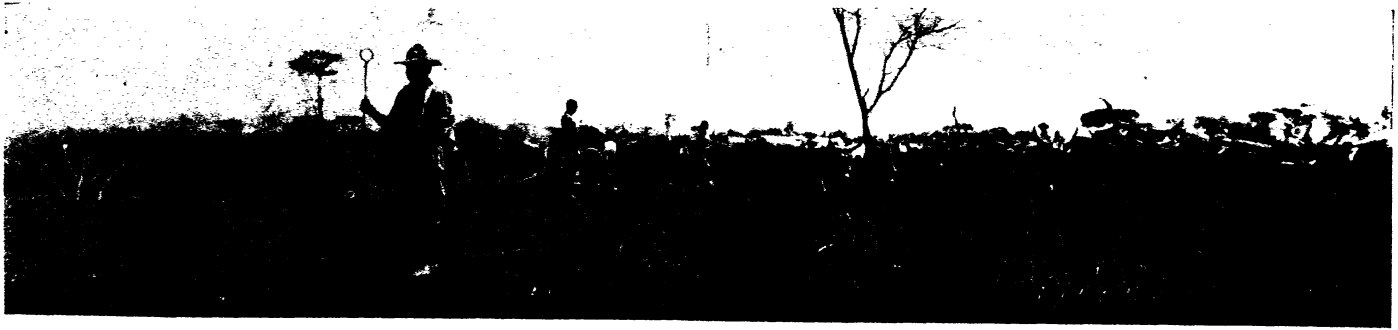
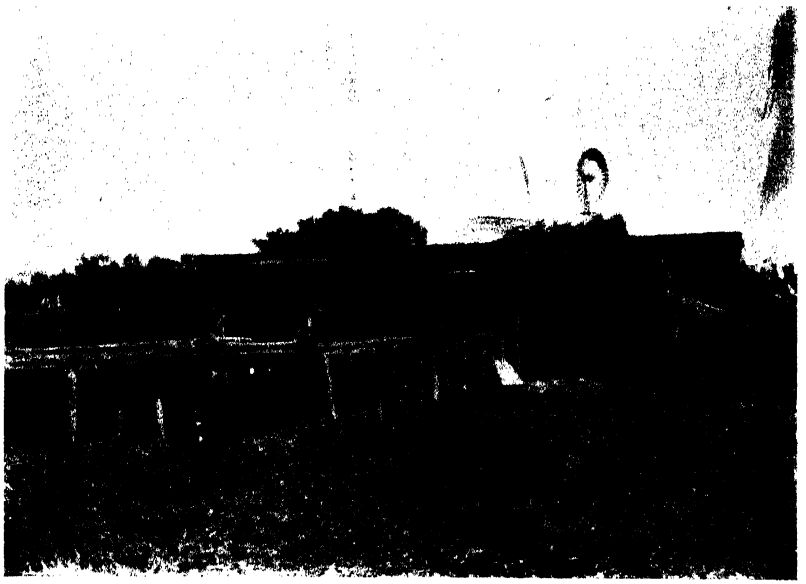


Photo by [J. S. Loosley

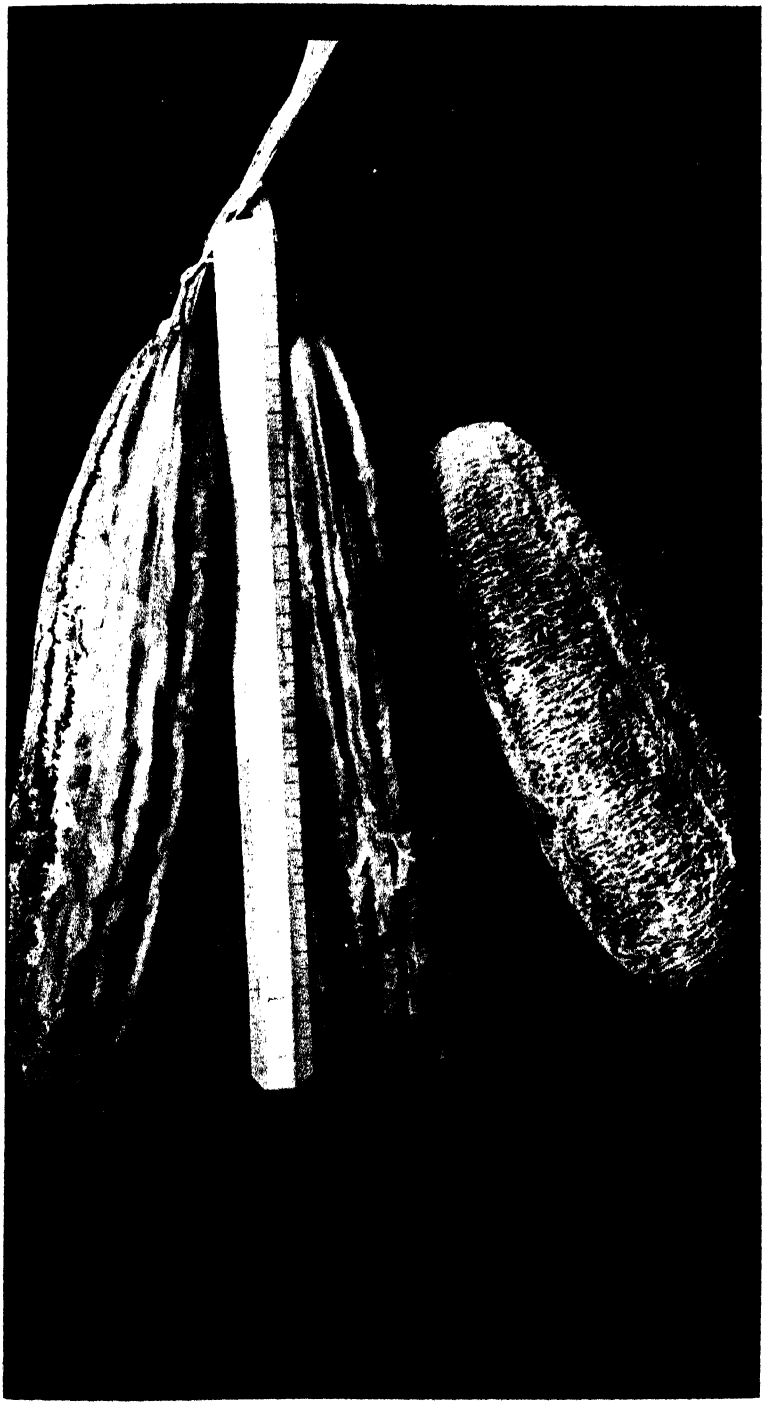
A Typical Stock Farming Scene.—Branding Cattle



Turkish Tobacco Shed and Frames, Tegwani



Turkish Tobacco on the Curving Frames, Tegwani



Loofah

fine imported shorthorn bull. From Redhill westwards along the border several farms lying in the Mopani veld have recently been occupied. Kensington, the home of Mr. J. Reid Rowland, only since July, 1908, is in rapid process of development. He is busy clearing bush, breaking land, making dams and furrows, burning bricks, fencing and doing the hundred and one other matters which the pioneer must attend to before taking up the ordinary routine of the farm and which as a matter of fact ought really never to be entirely finished to the satisfaction of a good farmer who always sees the need of some further improvement.

Inane is a stock farm belonging to Mr. A. Barclay and beyond that at Sevaka, the last occupied farm on that side and 25 miles from the railway at Plumtree, one is agreeably surprised to find a range of well built styes accommodating a number of pure-bred Berkshire pigs of high quality evidently doing well and paying well as pork and bacon and for stud purposes. Several prize winners at Bulawayo Show came from here. In view of the fact of the influx of settlers to this part, the presence of over 20,000 natives close to the border on the Tati side and the grave danger of the introduction of disease by stock either straying or being illicitly moved over into Rhodesia, the Government has taken up the task of erecting a fence along the border from the point where the railway crosses it to the south-westernmost point of Rhodesia, beacon No. 1 on the Panda-Matenka Road. This stretch of about 35 miles is now reaching completion, the Company provided the material, the owners of land undertook erection on their own lands and certain transport, while through the good offices of the Protectorate authorities Chief Rawe's people supplied transport and labour of erection under competent supervision on the remainder. By this means a considerable length of the border has been fenced and while no fence in itself can prevent accidents happening yet the chances of these are very much diminished and the prospects of preventing or tracing illicit movements much enhanced. Moreover stock near the border can with equanimity be allowed to graze up to the line without fear of mixing with foreign stock or of straying abroad unawares. This is the first stretch of fencing erected on the border of the Territory.

Dates of Meetings of Farmers' Associations, Southern Rhodesia

(SUBJECT TO ALTERATION).

Name of Association.	Place of Meeting.	Secretary.	1909	1910.											
			Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Mashonaland	Salisbury ...	W. H. Williamson ...	11	8	5	5	2	7	4	2	6	3	1	5	3
Rhodesia Landowners' ...															
Farmers'	Bulawayo ...	Harry Hopkins ...	30	27	24	31	28	26	30	28	25	29	27	24	29
Manica	Umtali	P. B. Snashall ...	4	8	5	5	2	7	4	2	6	3	1	5	3
Enkledoorn	Enkledoorn ...	A. J. Liebenberg ...	18	29	26	26	30	28	25	30	27	24	29	26	31
Lomagundi	Eldorado Mine...	J. J. Reynard	11	8	12	12	9	14	11	9	13	10	8	12	10
Makoni	Rusapi	F. A. Lapham ...	15	...	...	16	...	...	15	...	...	21	...	...	21
Marandellas	Marandellas ...	A. J. H. Nicholson ...	4	...	5	...	2	...	4	...	6	...	1	...	3
Matopos	Matopos... ...	W. E. Dowsett ...	26	...	...	6	...	...	5	...	...	4	...	...	4
Plumtree	Plumtree ...	J. Reid-Rowland ...	...	6	...	...	7	...	...	7	...	...	6	...	...
Victoria (Eastern)	Good Hope Farm	F. A. Readman ...	...	1	...	...	2	...	...	2	...	...	1	...	...
*Victoria	Victoria	James Rutherford ...													
Midlands	Gwelo	Geo. Watkinson ...	10	7	11	11	8	6	10	...	...	...	...	...	...
*Figtree	Figtree	J. T. Kirschbaum ...													
Melsetter	Melsetter ...	H. A. Oxenham ...	...	7	...	...	1	...	...	1	...	...	7	...	...
Gazaland	Chipinga ...	A. L. Sclater	2	...	...	3	...	5	...	...	4	...	...	3	...
*Mangwendi	Macheke ...	A. C. Fountain ...													
*Hartley	Hartley	S. J. Kuntzen	11												
*Mazoe	Mazoe	F. Eyles													

Dates of Meetings of Associations marked (*) are uncertain.

Notes from the Botanical Laboratory.

By H. GODFREY MUNDY, Agriculturist and Botanist.

THE SWORD BEAN.

We have recently received a specimen of the Sword Bean Canavalia ensiformis—(owing to the dryness of the material and the lack of flowers it has been found impossible to determine the species for certain) together with the information that it occurs fairly frequently on farms in the Mazoe district; and advice has been sought as to whether the bean can be put to any economic use.

The Sword Bean is a perennial widely climbing "Vine' having trifoliate leaves. Leaflets ovate or oblong. the central one 3-6 inches long, the lateral ones smaller and unequal sided. The flowers vary in colour from white to pink and have a fragrant smell. The pod is the shape of a curved sword, eight to twelve inches long by one to two inches wide and contains from eight to twelve or even more seeds. On the back of the pod are four prominent ribs or keels. The seeds are large and plain red in colour, in some cases they are whiteish or even marbled or mottled.

The plant is a native of the Eastern Hymalaya region, and is said to be cultivated in Ceylon, India, Japan, Siam, and Tropical Africa. Two varieties are described in "The Flora of Tropical Africa," namely, Canavalia ensiformis—the Sword Bean; and Canavalia obtusifolia—the Bay Bean; differing from one another in the colour of the flowers and of the seeds and also in regard to the relative hairiness of the foliage.

When young the beans of Canvalia ensiformis are said to make an excellent vegetable if sliced and boiled, and in the later stages of growth the nearly ripe beans are boiled and eaten in the same way as broad beans. The Bay bean (Canavalia obtusifolia) is native of Tropical Africa, Natal, Australia, and Tropical America, but is said to be poisonious when eaten raw, the beans having a bitter taste; but it is said to be eaten by the natives when cooked. As the two are closely related it is not unlikely that the Sword Bean might

also be injurious if eaten raw.

Whether the bean could be used largely as a stock feed or not depends upon the frequency with which it occurs, but if first boiled there seems no reason to fear that the beans would be injurious. Should it grow sufficiently freely and luxuriantly either the Sword or the Bay bean might well be used as a leguminous crop for green manuring in those districts where it naturally occurs. The plant is a luxurious grower and sown in the open and not permitted to climb should make a dense growth over the ground and afford an abundant supply of material for ploughing under, if not as forage.

TOOWOOMBA CANARY GRASS (Phalaris bulbosa).

During the last few years considerable attention has been devoted by the various Agricultural Departments of South Africa to the introduction of a pasture grass capable of withstanding the extreme drought and cold of mid-winter and so affording succulent green food for stock at a time of year when our native grasses are either partially or entirely lacking in this respect. The so-called new fodder grass Phalaris commutata now occupies a prominent place in the eyes of many of the farming community and coming as it does from Australia, with a great reputation for frost and drought resistance, much has been expected of it.

At first it was supposed that Phalaris commutata was probably a hybrid or a hitherto imperfectly described species, but since gaining notoriety several well known botanists have been working on the identity of this grass and the conclusions arrived at are published in the Kew Bulletin of Miscellaneous Information, No. 7, 1909. It is here shewn that the evidence in favour of treating Phalaris commutata as a new species is insufficient and the grass is therefore described as being merely an exceptionally robust strain of Phalaris bulbosa, a native of the Mediterranean region. It seems not unlikely that this more robust race has been gradually evolved as the grass has establised itself in countries other than its native habitat.

The history of Phalaris bulbosa, as it must now be called, is of considerable interest and as given by Dr. Otto Stapf in the Kew Bulletin is as follows :—

"About four or five years ago, Mr. Charles Ross, manager

of the State Farm, Westbank, Queensland, distributed in Australia a grass which was thought likely to develop into a first class fodder grass. It had been found by Mr. R. Harding, Curator of the Toowoomba Botanic Gardens, Queensland, in out of the way places such as hedgerows and rubbish heaps in the gardens under his charge, and was assumed to be one of a lot of about 60 grasses received by his predecessor, the late Mr. Way, from the Agricultural Department of the United States of America in 1884. It is stated that since none of them were doing well on account of great drought, they were thrown away on a rubbish heap and lost, with the exception of the one just mentioned.

Subsequently further material was distributed from the Toowoomba Gardens and in 1906 it was already under trial on the Biggenden State Farm, Queensland (Queensland Agricultural Journal XVI., 394), and on the Bathurst Experiment Farm, N.S.W. (Agricultural Journal N.S.W. XVIII., 700). It was at the same time recorded as doing very well in Gippsland, Victoria (Journal, Department of Agriculture, Western Australia, XIII, 381), and was the same year exhibited at the September Show of the Royal Agricultural Society at Adelaide (Journal, Department of Agriculture, South Australia, X., 690). It soon acquired the reputation of being an excellent drought resisting winter grass and, in 1907 was on that account introduced into Natal (Natal Agricultural Journal, XI., 1436)."

Since the above date this grass has been tested by the Cape and Transvaal Departments of Agriculture and in the January, 1909 number of the Journal of the former Department a most encouraging report was given which may be summarised as follows: "Grew 4 ft. high and withstood drought on the dryest part of the farm when all around the veld was brown. One stool was sub-divided and gave 76 plants, the average number of stools from each plant being about 50. The stalks, though in some cases 8 ft. high, were not thicker than oat straw. Results of chemical analysis are also given and these too are highly favourable.

Phalaris bulbosa has also been tested in parts of the Eastern High Veld of the Transvsal and is said to be most promising. One grower writing of it says; "Phalaris grew all winter with very early spring growth; it certainly seems to me the grass par excellence to grow." While another

either to the farm or to the outspan where tulp is known to occur :—

Where possible fence off the infected area. Avoid turning hungry stock on to the land known to be infested; rather, if possible, drive them to higher ground and allow them there to take the edge off their hunger. Avoid grazing cattle, as far as possible, during early spring on land known to be infested. When once the grasses have made a few inches growth the danger is greatly minimised. With newly imported stock take every precaution to avoid their having access to infested ground, otherwise mortality is almost certain to occur. If the area is comparatively small, plough it up and put in some crop. Ploughing the land acts as a temporary check and the plants are not usually so numerous on land which has once been broken, though in time they might re-establish themselves.

The following antidote is stated to have proved effective in cases of tulp poisoning, if discovered sufficiently early. We give it here for what it is worth.

"One handful of the roots boiled in one and a half quarts of water until reduced to one quart. Administer in two doses, half each time at intervals of three hours, or all in one dose if the case is sufficiently serious."

The late Mr. Hutcheon, Director of Agriculture and Chief Veterinary Surgeon of Cape Colony, wrote as follows regarding the treatment of tulp poisoning :—

"It may be accepted therefore as a general recommendation in the treatment of tulp poisoning, that in very accute cases, accompanied by diarrhœa, large doses of strong astringent and soothing medicine should be administered, such as Catechu and Opium, in order to arrest the action of the bowels and allay the acute inflamation. Good results have been obtained by using two to four drachms of powdered opium mixed in a pint of raw linseed oil and followed by large doses of starch gruel. A very soothing mixture for administering along with opium is a mixture of equal parts raw linseed oil and lime water. Large doses of milk and

limewater are also said to be beneficial. In my own experience the following dose proved highly effective :—

Powdered Chloride of Ammonia		1½ ounces
Extract of Belladonna	...	1 drachm
Warm water ...	...	1 pint

The dose repeated every four hours until four doses had been given.

In milder cases of poisoning, repeated doses of lime water and raw linseed oil with a little opium added will act as a soothing purgative. An excellent stimulant to a cow or ox suffering from such poisoning is half a bottle of whiskey or brandy mixed in two bottles of hot strong tea nicely sweetened. When evidence of tulp poisoning appears amongst cattle which have been newly placed on tulp-infested veld—in addition to treating suffering animals, it is advisable to give all the other animals similarly exposed a good dose of purgative medicine to clear out the irritant before it has time to produce its full effect."

BOBS WHEAT AND BARLEY WHEAT.

On another page will be seen a photograph of a sample sheaf of Bobs Rust Proof Wheat. grown by Mr. E. C. Boardman of Grootfontein, Enkeldoorn, and regarding which the following report is given :—

"Bobs Rust Proof Wheat.—Of this I kept a small lot over (10 lbs.) from the summer sowings, finding as I did that these were entirely choked by the luxuriant growth of weeds. The ten pounds of seed was put in in May on sandy soil with a very light dressing of kraal manure The wheat received three irrigations, viz., once at time of sowing, for the second time when commencing to stool, and lastly when just coming into ear. I have now reaped the crop and expect to get quite one full bag of grain from the 10 lbs. of seed sown. I have much pleasure in forwarding you a sample sheaf of this grand wheat."

As will be seen from the photograph, Mr. Boardman's praise is well justified and we have seldom seen a finer sample of wheat grown in South Africa. It is interesting to

note, that when tested in Rhodesia as a summer wheat "Bobs Rust Proof" has given promising results, and from Mr. Boardman's report it would appear that it is an even better variety for winter sowing and has the further advantage of partial immunity from rust.

"Bobs" is a mid-season wheat with a moderately tall, stiff straw. The grain is of good colour and is considerably "harder" than that of the average Australian variety, which can mostly be classed as soft wheats, and for this reason "Bobs" is in better repute amongst millers.

Mr. Boardman also grew Barley Wheat (Hordeum trifurcatum) and reports on it as follows:—

"Sown in May upon black sandy soil with a small dressing of kraal manure. It was three times reaped as green feed for cattle and pigs and was then allowed to ripen off and yielded one bag of seed. The sample was clean and I consider that the barley grew remarkably well."

It may be mentioned that Barley Wheat is rapidly replacing Cape Barley as a green fodder crop, the absence of beards making it more palatable to stock. As a grain yielder it is fully equal, if not superior, to Cape Barley, and having, as the name implies, a naked grain similar to that of wheat it forms an excellent feeding barley for all classes of farm stock.

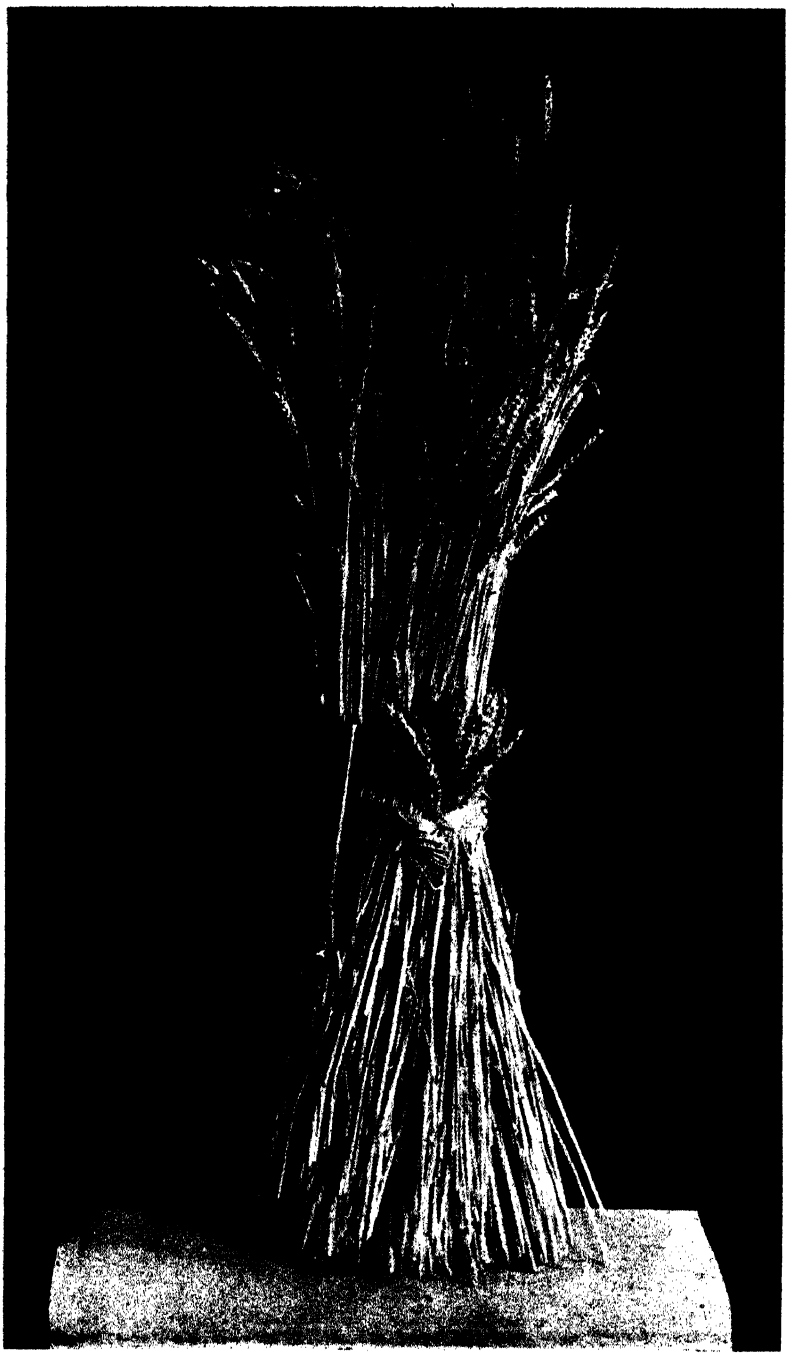


Photo by] [H. C. Thwaites

"Bobs" Rust-Proof Wheat

Reviews.

REPORT ON AGRICULTURE & VITICULTURE IN SOUTH AFRICA

BY LORD BLYTH.

Colonial Reports Miscellaneous, presented to both Houses of Parliament by command of His Majesty, October 1909.

This report is the result of a recent visit by Lord Blyth to Cape Colony, the Orange Free State, the Transvaal and Natal in order to enquire into the present condition of their Agriculture and the possibilities of its future development.

The wine growing industry receives consideration in a seperate report the conclusion of which in brief is that natural wines both white and red can be produced in many localities of a sufficiently good quality to satisfy the wants of a large proportion of the wine drinking population of South Africa and also that their is a prospect of a limited quantity of wines of the port wine type (Pontac) being exported for consumption to other parts of Europe.

With regard to agriculture in general Lord Blyth makes the emphatic statement "Indeed, I go so far as to say that no country has ever made greater agricultural headway in so short a period than has South Africa in the seven years since peace was proclaimed." This is high praise. The reason for this he assigns. "It is the large financial support of agricultural development by the Government of the Colonies of South Africa that has been so effective and encouraging of late years and which gives so much promise for the future."

The report deals with a variety of subjects, economical, political and industrial from the agricultural standpoint and is of interest as indicating the impression made upon a sympathetic and comprehending enquirer who was given every opportunity for obtaining the information he sought in the brief time at his disposal.

Perhaps the tone is too optimistic as when Lord Blyth expresses the view, "that science seems likely to banish altogether or keep in check rinderpest, East Coast fever, redwater, tick fever, and gall sickness in cattle; scab, heartwater, fluke and wireworm amongst sheep; horse-sickness, fly, and bots amongst horses; the insect pests of locusts,

mosquitoes (the source of malaria) and tick. As a consequence of these evils being practically cleared out of the way, there would appear to be a prosperous future for all who may seek an agricultural home in South Africa." Most of us hope for a prosperous future long before all these evils have been eradicated.

The great and pressing urgency of immigration by the right kind of agricultural settler to South Arrica is strongly emphasised. It is to be regretted that Lord Blyth did not extend his tour, as he did his report, to Rhodesia, for there can be no doubt but that, expressing himself as favourably as he does on several points connected with the northern of the South African States, he would have been more enthusiastic had he had personal knowledge of the Territory.

E.A.N.

THE BRANDS DIRECTORY FOR SOUTHERN RHODESIA.

The Directory contains a complete list in alphabetical order with names and addresses of the proprieters of brands registered from 1900 to January, 1909, under the Brands Ordinance. It will be found of value and assistance to large cattle owners and dealers, auctioneers and others interested in the ownership of stock. For convenience of reference a copy of the law governing the use of brands is included in the Directory, and a further list of brands registered will be published annually to keep this record up to date. The influence of the three-piece system is beginning to make itself manifest, all recent brands following a recognised rotation, duplication being rendered impossible, whilst there is no more chance of those fantastic hieroroglyphics which disfigure and damage the hide.

Owners of stock will at a glance be able to see what marks there are identical with or resembling theirs, whence confusion might arise. Some may desire, after such perusal, to cancel their old brand and adopt a new one. Many of the older brands are believed to have fallen out of use, but remain to cumber the register.

The Directory is issued neatly bound in red cloth at a price of 6/6 and is obtainable from the Office of the Controller of Printing and Stationery or from the Department of Agriculture.

E.A.N.

FARM AND STOCK—THE PORT ELIZABETH AGRICULTURAL SOCIETY'S YEAR BOOK.

This useful annual production has come to hand for the fourth year in succession since its inception. Such a wide range of subjects is covered that although primarely written for the benefit of the farmer in Cape Colony there is yet a mass of reading of much interest to his brother in Rhodesia. The latter will perhaps be most interested in an article on African Coast Fever written by Mr. W. Robertson, M.R.C.V.S., Veterinary Bactereologist to the Government of Cape Colony, who gives a brief resume of what is known on the subject. An instructive paper is contributed by Mr. W. Ingham, M.I.Mech.E. of Port Elizabeth, on Pumping Machinery and various sources of power, in which he deals in a very practical and concise manner with windmills waterwheels and turbines; hydraulic rams, ram pumps, bucket pumps, centrifugal pumps driven by oil engines, suction gas engines, steam engines, vertical centrifugal pumps. The paper is well illustrated and full of figures, but such figures as the layman can understand and which help him in applying the general advice given to his own particular case.

Other subjects on such useful subjects as cheesemaking by Mr. James Woodin, now our examiner of live stock in Cape Colony and the Orange River Colony; on meteorological instruments by Mr. C. M. Stewart, B.Sc.; on agriculture by Mr. W. S. C. Scully; and on modern veterinary instruments, will all appeal to Rhodesian readers. In a paper on Ephemeral Fever, or Three Day's Sickness, also sometimes misleadingly called Lamziekte, Mr. G. W. Frear, M.R.C.V.S., deals with the disease which appeared in North West Rhodesia in 1906, and passed so rapidly and mysteriously southwards. He makes interesting reference to a book of travel in Central Africa by Dr. George Schweinfurth, written about 1867, and entitled "The Heart of Africa," in which the author mentions a disease of cattle showing identical symptoms, and also refers to Mr. Bevan's statement that Matabele natives remembered its occurrence among their cattle and in Khama's Country 25 years ago. He attributes transmission of the disease to the agency of night midges.

E. A. N.

Agricultural Reports.

AUGUST AND SEPTEMBER, 1909.

MATABELELAND.—As a natural consequence of mining and the inflow of settlers the demand for labour is steadily increasing and although the supply is on the whole greater yet it does not keep pace with the need, particularly in certain districts where the want of farm labour is acute. Natives are, from contact with the white farmers, acquiring by degrees ideas of civilised methods and although at present they are applying it mainly to their own land, yet as they become familiar with such things at their kraals they may perhaps become more handy and efficient and ultimately rise to be a really useful agricultural labouring class, as have the natives further south. It is noticed, for instance, that in some parts they are watering their gardens in the dry season, and are commencing to see the value of the Government's efforts to cleanse their flocks of scab, while the plough is coming more and more into use; indeed it is stated as a fact, on the best authority, that among the more advanced Matabele the girls refuse to enter into a contract of marriage until the intended husband has become the possessor of a plough, a fact which rather discounts the common idea that the native women do all the arduous labour. Or is this a Matabele application of the Suffragette movement? As the ploughing season approaches labour tends to become more scarce. The native is also now buying cattle freely at prices from £8 to £12—a sign of prosperity and surplus wealth.

Cattle are thriving. The veld was very abundant towards the close of last season and stock are healthy, hence the lamentable falling off in condition which occurs annually at this time, has been less pronounced than usual, although latterly their have been deaths from poverty and the need of young grass began to be severely felt.

The tentative application of measures for the eradication of scab in the Msingwani area are proving effectual and the benefit is beginning to be appreciated.

Rain fell in many parts of Matabeleland in September,

though only showers, and native cultivation is well forward in consequence and the grass is coming on rapidly.

Flying locusts began to make their appearance in numbers in September but voetgangers have not been observed so far. Farmers and others should not fail to report the presence of voetgangers to the Police.

Wild dogs are reported to be on the increase in Gwanda and lions and leopards seem to be numerous and troublesome in parts.

An earthquake shock is reported from T'Shete in Sebungwe district on the 24th August.

MASHONALAND.—Owing to abundant native crops last year local labour is generally scarce and large demands have been made for alien labour for farm purposes. Fortunately this has been forthcoming and the Nyassa boys distributed by the Labour Bureau are giving general satisfaction in farm work.

Everywhere stock is reported as doing well, though not fat at this season of the year and generally in poorer condition than in Mstabeleland, although early veld has been plentiful.

Swarms of flying red locusts are numerous so that the outlook is serious should they breed in the country, as is probable. They have done considerable damage to crops grown under irrigation, wheat and oats, and to fruit orchards in Melsetter but elsewhere except for some injury to the early veld no harm has been done.

In both Mashonaland and Matabeleland grass fires have done much damage towards the end of the dry season. As in previous years farmers were advised of the preparedness of the Native Commissioners to call out the natives interested to assist in the burning of fire guards to prevent the spread of fires and to enable veld to be preserved where desired. In some districts as Matobos, this has proved an effective measure but special complaints come from Charter, Wankies and Msingwani. On the occasion of a recent inspection it was striking to observe the veld burnt for miles in the Bulalima

district, whereas across the border in the Tati Concession with 20,000 natives in one reserve there were only a few patches of burnt grass to be seen and these were of but a couple of acres each. Where the native wishes, the veld can be protected, at the same time the native is not the only culprit, the transport rider, the prospector and the sportsman, especially the urban week-end sportsman, is responsible for much wanton mischief. Complaint is frequently made of the inadequacy of the penalty and certainly it is not possible to make the fine in any way proportionate to the loss occasioned to the owner of the veld, whose stock are within an hour bereft of their reserve store of grazing at the time it is most needed. The paltry penalty the law imposes is as nothing to the loss of condition, loss of subsequent calves, and loss of lives costing the individuals hundreds and the country at large thousands of pounds annually. It is difficult to catch delinquents and more difficult to prove the case. It is of interest to note that in Victoria district during September fourteen natives were convicted of illegal grass burning and it is to be hoped that exemplary sentences were inflicted and a lesson taught to others. For this year the danger is over but it is disappointing and annoying year by year to hear so much discussion or the subject and so little of any amelioration

Veterinary Report for the Months of September and October.

SEPTEMBER, 1909.

SALISBURY.

No contagious disease.

The following imported animals were tested with Mallein and found healthy :—

Horses	...	...	6
Mules	...	...	52
Donkeys	...	...	9
			67

BULAWAYO.

EQUINE SCABIES.—An outbreak occurred amongst the mules belonging to the Municipality and the affected animals and the stable were placed in quarantine.

FLUKE DISEASE.—Postmortem examination of three head of cattle on the farm Rangemore revealed the presence of Fluke disease associated with parasitic gastric enteritis. This is the first recorded case in Bulawayo district of Fluke in locally-bred cattle. It has been observed in other parts of the territory and is frequently seen in cattle from Zambesi Valley. Excepting during or after a heavy rainy season the conditions of this country are not favourable to the propagation of this parasite.

MALLEIN TEST.—The following imported animals were tested and found healthy :—

Horses	...	...	39
Mules	...	...	99
Donkeys	...	...	109
			247

MARONDELLA.

AFRICAN COAST FEVER.—Fresh outbreaks: None.
Existing Outbreaks: Three Deaths.

MELSETTER.

SCAB.—No outbreak.

LOMAGUNDI.

Nine deaths from Trypanosomiasis amongst the Northern cattle in quarantine in this district are reported.

HARTLEY.

Several head of cattle died from Trypanosomiasis. The number of Tsetse Flies in the infested areas seem to have decreased considerably. After a careful search only a few were found.

UMTALI.

AFRICAN COAST FEVER.—It is now nine months since the last suspected case occurred.

WIREWORM.—The flock on the farm Fairview (outbreak reported previous month) is progressing well after treatment with sulphate of copper solutions and change of pasture.

CALF DISEASES.—In a herd in which last season the mortality was very great only one case has occurred to date during the present season and this is attributed to the delay in ligaturing an abnormally large umbilical cord. The preventative measures adoptted in this herd appear to be most satisfactory.

The disease referred to is of the "white scour" type investigated by Nocard in Ireland in 1901.

Gwelo, Selukwe, Charter, Victoria, Mazoe, Makoni, M'rewas, Darwin, Belingwe, Bulalima-Mangine, Gwanda, Sebungwe and Insiza.

No contagious disease reported except Scab.

J. M. SINCLAIR,
Chief Veterinary Surgeon,

OCTOBER, 1909.

SALISBURY.

No contagious disease.

GLANDERS.—The following animals were tested with mallein upon entry and found healthy:—

Horses	8
Mules	19
	27

BULAWAYO.

EQUINE SCABIES.—The mules reported infected last month have been cured and released from quarantine.

GLANDERS.—The following animals were tested upon entry with mallein and found healthy:—

Horses	32
Mules	21
Donkeys	10
	63

MARONDELLA.

AFRICAN COAST FEVER.—Fresh outbreaks: None.

Existing outbreak: Thirteen deaths.

The fencing of the infected area is being proceeded with.

UMTALI.

AFRICAN COAST FEVER.—Fresh outbreaks: None.

Existing outbreak: No deaths.

SCAB.—One outbreak.

No contagious disease is reported from Hartley, Gwelo, Selukwe, Victoria, Enkeldoorn, Melsetter, Makoni, M'rewas, Mazoe, Darwin. Chilimanzi, Insiza, Chibi, Inyanga, Gwanda, Matobo, Bulalima-Mangwe and Mafungabusi.

J. M. SINCLAIR,
Chief Veterinary Surgeon,

Garden Calendar.

By N. L. KAYE-EDDIE.

THE FLOWER GARDEN.

January.—This month requires all one's energy in the flower garden. Annuals may still be sown for late flowering before the season is over. Planting ont should be done as early as the weather permits and advantage taken of a dull day after a shower for this work. If care be exercised much smaller plants may be put out then would at first be thought advisable, as with attention these will make stronger plants than larger ones which are more likely to receive a check. The soil requires constant stirring owing to the packing caused by the rains and for the eradication of weeds which are now very troublesome. All plants should be kept free of dead and decaying matter.

February.—During this month the flower garden is gradually approaching perfection, and nearly all plants are in bloom. If these are constantly plucked the yield will be increased and, except when required for seed, all flowers should be removed as they fade, for seeding shortens the life of many plants. All runners and creepers should have constant attention, and be tied up and trained. Dahlias in more exposed positions should be carefully tied to their stakes, as they now become top heavy with the weight of their blooms. Palms in the house and conservatory will benefit much if occasionally put out in the rain.

VEGETABLE GARDEN.

January.—Turnips, carrots, cabbage, lettuce, etc., may be sown for carrying on during the winter months. Potatoes may be planted this month for keeping through the winter. Weeding and culivating between the rows should be continually carried on.

February.—Potatoes should receive attention and be carefully ridged up and care be taken that the stalks are not burried. Seeds for winter crops should be sown, such as beet, Brussels sprouts, cabbage, carrots, beans, peas, onions, turnips, tomatoes, etc. Vegetables planted out during this month might be placed a little closer together than usual, as watering may have to be resorted to before they mature.

Market Reports.

Since last report there has been an improvement in the London market for cereals, and prices are somewhat firmer. The demand for South African maize has slightly increased, and prices are given at, Round Yellow, 24/6 to 24/9 per quarter, c.i.f.; White Flat, 24/6 to 25/- per quarter, c.i.f. Reports received to date indicate that the local market is well supplied with grain, and prices will remain about the same throughout the season. The supply of local wheat has improved and come in more freely this season.

The following are the latest market quotations received:—

(1) Jas. Lawrence & Co. (Transvaal), Ltd., 17th Nov., 1909—

Barley, per 150 lbs. ...	10/6	12/0	Onions, per 120 lbs. ...	3/6	9/0
Beans, per 200 lbs. ...	12/6	35/0	Peas, per 200 lbs. ...	10/6	12/6
Bran, per 100 lbs. ...	7/3	7/8	Potatoes, per 150 lbs. ...	13/6	18/0
Chaff, per 100 lbs. ...	2/9	4/0	Rye, per 200 lbs.	13/6	14/6
Forage (T'vaal), 100 lbs.	5/6	7/6	Salt, per 200 lbs.	4/6	5/3
„ (O.R.C.) „	4/0	5/0	Boer Meal, sifted, per 200 lbs.	21/0	28/0
„ (Colonial) „	7/0	7/9	Wheat, per 200 lbs. ...	21/0	22/0
Hay, per bale	9d	1/1	Butter, per lb.	9d	1/4
Kaffir Corn, White, per 200 lbs.	6/11	7/4	Eggs, per dozen	11d	1/1½d
Kaffir Corn, Red, per 200 lbs.	7/4	8/0	Ducks, each	2/6	3/2
Lucerne, per 100 lbs. ...	4/6	5/6	Fowls, each	1/6	3/4
Manna (baled) per 100 lbs.	3/6		Geese, each	4/6	5/0
Mealies, (S.A.), White, per 200 lbs.	7/10	8/4	Turkeys	5/0	13/6
Mealies, (S.A.), Yellow, per 200 lbs.	8/9	9/4	Pigeons, each	9d	10d
Oats, per 150 lbs. ...	7/6	11/11	Slaughter Oxen	£10/10	£14
			Sheep, per lb., dressed weight	4d	4¼d
			Pigs, per lb.	2¾d	3¾d

(2) Jas. Lawrence & Co., Ltd. Kimberley, 26th Nov., 1909.—

Bran, per bag 100 lbs ...	6/6	6/9	Potatoes, per bag 163 lbs	6/0	10/0
Barley, per bag 163 lbs ...	8/6	11/6	Potatoes, new	10/0	15/0
Beans, Sugar, bag 203 lbs	28/6	30/6	Tobacco, good, per lb ...	4d	7d
Beans, Kafir, 203 lbs ...	9/6	10/6	Tobacco, inferior, per lb	1d	2d
Chaff, Colonial, bale ...	6/6	9/6	Wheat, per bag 203 lbs ...	23/0	26/0
Chaff, Colonial, pressed, 100 lbs	3/0	3/6	Butter, fresh, per lb ...	1/3	1/6
Forage, good, per 100 lbs	5/6	6/0	Butter, second quality ...	1/0	1/2
„ inferior, per 100 lbs	—	—	Eggs, per dozen	9d	1/0
Kafir Corn, S.A., mixed	6/6	7/0	Ducks, each	2/6	3/0
Kafir Corn, White ...	6/6	7/0	Fowls, each	1/9	2/3
Boer Meal, Colonial, unsifted	27/0	28/0	Turkeys, each	6/0	13/0
Boer Meal, Colonial, sifted	29/6	32/6	Hams and Bacon ...	—	—
Flour, Colonial, per bag 100 lbs	16/6	17/0	Salt, per bag	3/0	4/0
Yellow Mealies, Colonial, 203 lbs.	8/9	9/0	Walnuts, per lb	—	—
White Mealies, Colonial, hard, 203 lbs	8/9	9/0	Dried Peaches, per lb. ...	2d	4d
White Mealie Meal, 183 lbs	9/6	10/6	Dried Apricots, per lb. ...	2d	4d
Oats, per bag 150 lbs ...	10/0	11/0	Lime, per bag	2/6	3/6
Lucerne Hay, per 100 lbs	4/6	5/6	Oranges, per 100... ...	7/0	11/0
Onions, per bag 120 lbs...	5/0	10/0	Naartjees, per 100 ...	2/0	5/6
			Pineapples, per dozen ...	2/0	3/6
			Strawberries, per box ...	3/0	5/0
			Beans, green, per lot ...	4d	6d
			Peas	3d	5d
			Cabbages, per dozen ...	3/0	6/6

SLAUGHTER.

Oxen, good, prime, 600 lbs upwards	£6/10	£9
Cows, good, 450 lbs upwards	£4/10	£6
Calves, per lb dead weight		4d
Pigs, 100 lbs (clean), per lb live weight	3d	3¼d
Lambs, 30 lb	6/6	8/6
Hamels, 40 lb to 45 lb ...	8/0	12/0
Cape Sheep, good ...	10/0	12/6
Kapaters, good	10/0	12/6
Oxen, Trex	£5	£6/10
Riding Horses	£10	£25
Draught Horses	£10	£22/10
Mares	£9	£20

(3) Hubert Morisse & Co., Johannesburg, 19th Nov., 1909.—

Barley, per 163 lbs ...	10/6	12/6
Bran, per 100 lbs, Colonial	6/11	7/3
Chaff, best, 100 lbs ...	2/6	3/9
Eggs, per doz, Colonial...	1/0	1/3
Salt, per bag	4/9	5/0
Forage, Transvaal ...	6/6	7/9
„ Colonial, best, 100lbs	7/6	7/9
„ med. & inferior „	4/0	5/9
S. Meal, best fine... ...	24/6	28/3
Rye...	18/0	18/6
Wheat	20/6	23/0
Mealies, Hickory King Whites	8/0	8/3
Mealies, O.R.C. Whites...	7/10	8/0
Mealies, Yellow	9/4	9/6
Kafir Corn, per 203 lbs ...	6/11	7/9
Hay, Sweet, Transvaal...	9d	1/1
Lucerne, per 100 lbs ...	4/6	6/0
Manna	2/6	5/0
Transvaal Hay	6d	10d
Oats, per 153 lbs... ...	7/6	11/10
Potatoes, best, per 153 lbs	13/6	17/0
„ med. and inferior	7/0	12/6
Onions, Cape, 120 lbs ...	9/6	10/3
Turkeys, Cocks ...	9/0	18/0
Turkeys, Hens	5/0	8/6
Fowls	1/6	3/0
Ducks	2/3	3/3
Geese	4/6	5/6
Pigeons	8d	10d
Butter, O.R.C.	11d	1/2
Pumpkins, each	2d	4d
Beans, per 200 lbs, Sound	13/6	39/0

Slaughter Oxen	£12	£15
Slaughter Cows	£8	£10
Beef, per 100lbs, prime ...	£1/17	£2
Milch Cows, Cape ...	£19	£30
Trek Oxen	£7/10	£8/10
Tollies	£5	£5/10
Sheep, Cape and Bastard	4d per lb	
„ „ ...	13/0	16/6
Sheep, Merino	4d	4½d
„	13/0	17/6
Slaughter Ewes	10/6	13/0
Lambs	10/6	14/0
Goats, Boer Kapaters ...	12/6	18/6
Pigs, live weight	2¾d	4d
Mules, large	£20	£26
Mules, medium	£16	£17/10
Mules, small	£13	£15
Horses, good	£16	£25
Horses, ponies	£9	£13
Donkeys	£6	£7
Heifers, 12 to 18 months	£5	£6
Heifers, 2 to 3 years ...	£6	£7/10
Cows, breeding	£7	£8/10

(4) Whitfield & Co., Salisbury, 27th Nov., 1909.—

Cows, good milkers ...	£25	£35
Cows, Native	£9	£10
Heifers, Colonial	£7	£8
Heifers, Native	£5	£6
Trained Oxen, large ...	£12/10	£15
Trained Oxen, ordinary ...	£10	£11
Mules, inoculated	£25	£30
Mules, not inoculated ...	£20	£25
Horses	£25	£30
Donkeys, Colonial... ...	£6	£7/10
Donkeys, G.E. African ...	£5	£6
Sheep, Colonial		£1/5

(5) Wightman & Co., Ltd., Salisbury, 27th Nov., 1909.—

Mealies, per 200 lbs ...	11/6	12/0
Rapoko, per 200 lbs ...	10/6	11/0
Oat Forage, per 100 lbs...	8/6	10/0
Potatoes, per lb	1½d	1¾d
Onions, per lb		2¾d
Beans, per 200 lbs ...	16/0	17/6
Monkey Nuts, shelled, per lb		1¾d
Monkey Nuts, unshelled per 83 lbs	8/0	9/0
Wheat, per 200 lbs ...	30/0	32/6

Editorial Notices.

The "Journal" is issued bi-monthly, and the subscription is 5s. per annum, payable in advance. All communications relating thereto should be addressed to the Director of Agriculture, Agricultural Department, Salisbury, and if an answer is required in the pages of the "Journal," should reach this office not later than the 15th of the month preceding publication. Subscribers are requested to notify immediately the non-delivery of the "Journal."

TO ADVERTISERS.—Application for space in the "Rhodesian Agricultural Journal," from the February number onwards, should be addressed to the Director of Agriculture, Salisbury, from which date the rates will be as follows, per issue :—

Position.	Whole Page. £ s. d.	Half Page. £ s. d.	Quarter Page. £ s. d.
Inner Pages	2 0 0	1 5 0	0 15 0
Outer Cover (back) ...	4 0 0	—	—
Inner Covers (back and front) and page facing Contents	3 0 0	1 15 0	1 0 0

A discount of 10 per cent. will be allowed for standing or consecutive advertisements running through six issues. Remittances, and electros where desired, should accompany orders. The right is reserved to discontinue the insertion of standing or consecutive advertisements should payment beyond the second issue be delayed.

The right of approval of all advertisements by the Director of Agriculture is reserved and his decision as to the acceptance or rejection is final.

An additional charge may be made for advertisements printed in special type, equal to any additional charges made by the printers for setting up same.

Advertisements will be accepted from bona fide farmers wishing to effect sale, purchase or exchange of produce, live stock, or farm implements, at a minimum charge of 2s. 6d. per insertion of 20 words. Extra words will be charged for at the rate of 1s. for every 10 words.

Departmental Notices.

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, etc.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

CO-OPERATIVE EXPERIMENTS.

The Department of Agriculture has stocked the following seeds for distribution this season under the usual terms of Co-operative Experiments. Farmers anxious to test crops on a small scale before sowing more largely, are invited to send in their applications as soon as possible. The distribution is limited, and not more than three to five sorts can be sent to each applicant. The amount sent to any one farmer will depend on the number of applications received, but in any case, sufficient seed will be forthcoming to give the crops a fair trial.

Seed is issued f.o.r. Salisbury, but farmers are expected to pay railway carriage. When the Agricultural Parcels Post Regulations are applicable this means of forwarding will be used as being cheaper and more rapid. Under these terms the seed is issued, on condition that the farmer co-operating supplies at the end of the season a true report on the result of the experiment on forms supplied for that purpose.

Applications should be addressed to the Agriculturist, and as far as possible, will be dealt with in the order in which they are received. The seeds stocked are as follows:—

LEGUMINOUS CROPS FOR HAY, SILAGE, GREEN MANURE AND PASTURAGE.—Lucerne for irrigated or dry land, Sulla,

Florida Beggar Weed, Egyptian Clover, Tares or Vetches, Lupines, Sanfoin, Cowgrass Clover, Cowpeas, Velvet Beans,

MAIZE.—Iowa Silver Mine, Hickory Horse Tooth, Champion White Pearl, Yellow Hogan, Eureka Field Corn.

HAY AND WINTER PASTURE, GRASSES.—Tall Fescue, Burnet, Paspalum, Sheep's Parsley, Rescue Grass, Guinea Grass, Teff Grass.

MISCELLANEOUS SEEDS.—Rice (improved varieties), Pea Nuts or Monkey Nuts, Castor Oil, Linseed, Rape, Chicory.

SALE OF PASPALUM GRASS.

Slips of this valuable winter grass, for moist situations, are obtainable on application to the Director of Agriulture, Salisbury, packed in bags and f.o.r. Salisbury Station, at the rate of 5/- per 1,000. Good measure is given and remittanee must accompany all orders.

MULBERRY CUTTINGS.

Mulberry Cuttings, f.o.r. Salisbury, 5/- per 100. Apply, Manager Experimental Nursery, Salisbury.

STRYCHNINE.

Stockowners can obtain a limited quantity of strychnine for the destruction of carnivora at a cost of 3/6 per ounce.

TOBACCO SEED.

All enquiries for tobacco seed should in future be addressed to The Manager, Rhodesia Tobacco Warehouse, at Salisbury or Bulawayo.

TOBACCO SEED BED COVERING.

A large supply of calico for covering tobacco seed is now available. It can be obtained from the Anglo-African Trading Company at Salisbury, Bulawayo and Gwelo. Price 2½d. per square yard.

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seeds of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest

station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where the seed can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transactions.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem, leaves, flowers, and where possible fruit. Any particulars regarding the habits of the plant, the parts of it which are supposed to be poisonous, etc., will be welcomed, and in return the Department will supply all available information regarding the plants.

DESTRUCTION OF WILD CARNIVORA, ETC.

It is hereby notified for public information that the rewards for the destruction of wild carnivora, etc., will be paid only on the scale and conditions herein set forth.

2. Rewards will be paid as follows :—

For each Lion	£3	0 0
„ Leopard	1	0 0
„ Cheetah	1	0 0
„ Wild Dog	0	10 0
„ Crocodile, of not less than 3 ft. in length	0	10 0

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, and to natives by the Native Commissioner of the district, within three months of the date upon which the animal is killed, on a declaration made in the form of the annexure hereto.

4. In proof of destruction, applicants for rewards will be required to produce and surrender, in the case of the Lion, Leopard or Cheetah, the skin with the tail not severed, and in the case of the Crocodile or Wild Dog, the unskinned head.

5. The skins and heads of animals for which rewards have been paid shall be the property of the Government, and shall be disposed of in such manner as may be decided on.

GOVERNMEMT STALLION FOR PUBLIC STUD.

The Stallion "Robber Knight" has been returned to Bulawayo, where his services for a limited number of mares will be available until further notice, free of charge.

Applications, giving full particulars of the mares to be served, should be addressed to the Veterinary Department, Bulawayo, where further particulars can be obtained.

The owners of mares brought to stud will have to make all necessary arrangements for attendance, stabling and feeding of their animals, as the Department can take no responsibility whatever.

As the number of mares which can be served is very limited, the Veterinary Officer in charge is instructed to refuse service if any mare submitted is suffering from any hereditary disease, or is of an inferior type.

PEDIGREE.—"Robber Knight" by "Sir Hugo," ex "Fritters" by "St. Simon."

PURCHASE OF STUD STOCK BY GOVERNMENT ON BEHALF OF FARMERS.

Arrangements have been made whereby farmers may purchase pure bred stud stock through the Department of Agriculture.

Besides securing the benefit of the most competent judges to select the animals, whether in South Africa, England or Europe, purchasers are enabled to make payments by instalments spread over a period of one year.

For full particulars application should be addressed to the Director of Agriculture, Salisbury.

LOANS FOR FENCING.

The B.S.A. Company is prepared to advance funds to any owner of a farm beneficially occupied by a white person, to provide fencing material, on the following conditions :—

1. Half the cost of the material at nearest station or siding will be advanced, in no case exceeding the sum of £150.
2. Payment shall be made in ten equal annual instalments, or less if the applicant desires, together with interest at 5 per cent. per annum, payable in July, but no repayment will be called for within one year of granting the loan.
3. The applicant will be required to pass a first mortgage bond over his farm as security for the loan, *or* to furnish personal security to the satisfaction of the Board.

The loan will be made on completion of fence, and subject to inspection by a representative of the Company. The fence may be erected to any pattern approved by the Board, but for guidance the following minimum requirements will normally be insisted upon :—

Straining posts not farther than 440 yards apart ; standards not farther than 60 feet apart ; droppers or lacing not farther than four yards apart ; if no droppers are used standards should not be more than 20 feet apart. If wooden strainers, standards or droppers are proposed to be used, the kind is to be specified.

Applications stating the situation and mileage, and furnishing specifications of fence proposed to be erected, and accompanied by firm and detailed quotations for the material required and cost at nearest station, must be addressed in the first instance to the Director of Agriculture, Salisbury. Applicants should state whether internal or boundary fences are to be erected.

Preference will be given to farmers in areas which have adopted Part I. of the "Fencing Ordinance, 1904," and to boundary fences, but all applications will be considered.

Farmers are invited to submit applications for the consideration of the Fencing Board to the Director of Agriculture, Salisbury.

Government Notices.

No. 223 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 30th September, 1909.

IT is hereby notified for public information that His Honour the Acting Administrator has been pleased to approve of the temporary appointment of James Woodin, Esquire, to be examiner of Stock for the purpose of granting permits for the introduction of Livestock into Southern Rhodesia.

By command of His Honour the Acting Administrator.

P. D. L. FYNN,
For Treasurer.

No. 211 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 16th September, 1909.

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseaess Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—

Grass	Straw
Hay	Lucerne Hay
Forage	Green Lucerne
Sugar Cane	

or any other bedding or fodder plant.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,
For Treasurer.

No. 295 of 1908.
Department of Agriculture,
Administrator's Office,
Salisbury, 1st October, 1908.

IMPORTATION OF STOCK.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 8, of the 19th day of January, 1905, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries enumerated is prohibited, owing to the existence or supposed ex-

istence of destructive diseases affecting the said animals in the said countries:—

(1) All animals from the Island of Mauritius.

(2) All animals from German South-West Africa and all animals except donkeys from German East Africa.

(3) Pigs from the colonies of the Cape of Good Hope, Transvaal and the Orange River Colony, the Bechuanaland Protectorate, the Tati Concession, and other countries in which swine fever exists, subject, however, to the exceptions contained in the proviso to this section.

(4) Dogs from the territories of North-Eastern and North-Western Rhodesia and Portuguese East Africa; provided, however, that dogs from countries from which importation is permitted may be introduced through the port of Beira and brought direct into this Territory.

(5) Sheep and goats from (a) the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingswilliamstown, Komgha, Peddie, Somerset East, Stockenstroom, Uitenhage, and Victoria East, in the Cape Colony; (b) the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterburg, and Zoutpansberg, in the Transvaal; (c) Swaziland; (d) Portuguese Territory; (e) places north of the Zambesi River.

Provided, however, that the Controller of Stock may at his discretion permit the importation of pigs under six months of age for breeding purposes from the places mentioned in sub-section (3), and sheep and goats from the places mentioned in sub-section (5) hereof, on production of a certificate of a duly authorised Government veterinary officer that such animals are free from disease, have not been in contact with diseased animals, and have not come from an area where destructive disease has existed for twelve months previously.

2. The importation of organic manures, except guano, is strictly prohibited, and the importation of bone meal and bones required for fertilising or feeding purposes will only be permitted when accompanied by the certificate of a responsible and competent person that they have been thoroughly disinfected by treatment by superheated steam or other approved method. Any such manures, bone meal or bones introduced into Southern Rhodesia contrary to this regulation shall be liable to immediate destruction.

3. The areas set out in Schedule "A," and such further areas as may be added to the said schedule, shall be used in connection with pasture lands of the places to which they relate for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever.

4. The appointment of the areas set out in Schedule "B" hereto for the depasturing and quarantining of animals for slaughter in connection with the places therein mentioned is confirmed.

5. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel and the period for which the permit shall be in force. In cases where it may appear necessary or desirable, the person to whom any such permit is issued may be required to cause the animals

referred to therein to be dipped before being moved.

6. The introduction of sheep and goats against which no prohibition exists may be permitted by rail, subject to the following provisions:—

(1) Plumtree shall be regarded as the port of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto; provided, however, the Controller of Stock may allow the introduction of well-bred sheep or goats intended for sale or stud purposes without being previously dipped.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival; provided, however, that animals intended for immediate slaughter shall be exempt from dipping if marked with a distinctive brand on the back.

7. The introduction of sheep and goats against which no prohibition exists may be permitted by road, subject to the following provisions:—

(1) M'Lala Drift and Fort Tuli shall be regarded as ports of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival.

8. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Officer at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detrained at any intermediate station without the written authority of a Government Veterinary Surgeon.

9. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the police camp nearest to the place where such entry is made, and the officer in charge of such police camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

10. All horses, mules and donkeys upon entering Southern Rhodesia shall be tested with mallein, and the owner or person in charge of such animals shall, in all respects, carry out the lawful directions of the Inspector while such animals are being tested; provided that this regulation shall not apply to animals in transit by railway through Southern Rhodesia and which are not detrained en route.

11. The Inspector may direct the detention of any animal, and its isolation for the purposes of such examinations and tests as may be deemed expedient during which period of isolation or detention it shall be maintained and tended at the expense of the owner. If in the case of any such animal a second injection of mallein, applied at an interval of not less than ten days, is followed by a reaction indicative of the existence of glanders, such animal shall be forthwith destroyed.

12. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border to and from Portuguese East Africa, may be allowed so to cross on such terms as to registration, branding, testing and other conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

13. All horses, mules and donkeys depastured on the town lands of Melsetter and Umtali or on any public outspan adjoining such lands, and within the following area known as the Penhalonga, Imbesa and Samba Valleys, as bounded by the Umtali Waterfall Range on the north, the divide following beacons 18, 24 and 27 on the east, the Christmas Pass Range on the south, and the Palmyran Range on the west, in the district of Umtali, shall be dipped every fourteen days, by or at

the expense of the owner or person in charge of such animals, unless the local Veterinary Officer shall see fit to dispense with such dipping.

14. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings, fodder, excreta or other matter or thing which may be reasonably calculated to convey such infection.

15. Any person contravening the provisions of these regulations, or pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or be liable in respect of each offence to a penalty not exceeding twenty the instructions or directions given in terms of these regulations, shall heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

W. H. MILTON.
Administrator.

By command of His Honour the Administrator.

F. J. NEWTON,
Treasurer.

SCHEDULE "A."

Areas on or near pasture land used in connection with townships set apart for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever:—

1. For the township of Salisbury and its neighbourhood, the Government Farm Makabusi, as defined in Government Notice No. 13 of 1898, namely, about six miles from Salisbury on the Old Charter Road, and bounded on the north, north-east and west by the farm "Willowdale," and on the south and south-east by the Makabusi River.

2. For the township of Umtali, a triangular piece of land situate to the north-east of the township, being that portion of the farm "Birkley" which falls in British territory.

3. For the township of Melsetter, a piece of land included within those lines bounding the pasture lands laid out around the township, which are in common with the outspan in the west, Sawerombi on the north, and Westfield on the north-east, bounded further on the south by a line drawn from the common beacon of Westfield and Lindley to the common beacon of Fairfield and outspan.

4. For the township of Enkeldoorn, a piece of land about 2½ miles due west of the township and bounded as follows: From a point about 400 yards above the junction of a stream running south of Enkeldoorn township with streams running west from the Police Camp; thence along the first stream to the junction aforementioned; thence along a valley running due south from the said junction to a point about 700 yards distant; thence in a north-westerly direction to a point on the top of a rise about 1,200 yards distant; thence in a straight line to the first-mentioned point.

5. For the township of Victoria, a strip of land half-a-mile in width lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

6. For the township of Gwelo, a triangular piece of ground within the reserved lands around Gwelo. It is bounded south by the Watershed Block along its boundary running from its joint beacon with Kanuck westwards to another beacon 1,518 Cape roods distant, bounded north-westwards by a line about 1,350 roods in length to the Inoculation Station, and bounded north-eastwards by a line from the first mentioned beacon to the Inoculation Station, and about 1,400 roods in length. This piece of ground is called the Inoculation Camp.

7. For the township of Bulawayo that portion of the commonage bounded on the west and north by the Bulawayo-Mafeking and Gwelo

railway lines, on the east by the road known as "Hillside Avenue," on the south to the limits of the commonage and Hillside, known as "Napier's Lease," approximately 4,000 acres in extent.

SCHEDULE "B."

Areas set apart for depasturing and quarantining of animals for slaughter:—

SALISBURY.—Description of the area.—A piece of land, 400 acres in extent, situated on the Makabusi River, below Maggio's plot, towards the southern boundary of the Salisbury commonage.

BULAWAYO.—Description of the area.—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi Road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres, more or less.

GWELO.—Description of the area.—Starting from a point where the Ingwenia Road crosses the railway, along this road past the sanitary stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the commonage beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins Main Street extension along this to the railway line, and down this to the starting point.

UMTALI.—Description of the area.—Starting from a point at the south-east corner of the farm "Devonshire" and south-west of "Waterfall," up the stream to where it is joined by the stream commonly known as Rifle-butt Spruit, and up this spruit to a point 300 feet below Paulington Bridge. Thence almost due north on the west of Penhalonga Road to the sanitary pits and from the sanitary pits to the Cemetery, thence due west to the "Devonshire" line and along this line south to south-west corner beacon of "Waterfall."

SELUKWE.—Description of the area.—A piece of fenced land, in extent about 300 acres, situated on the farm "Sebanga" and adjacent to the township of Selukwe.

PENHALONGA.—Description of the area.—A piece of land bounded as follows:—To the northward by a line starting from the south-east beacon of the hotel stand to the south-west and south-east beacons of Crawford's butchery. To the eastward from the south-east beacon of Crawford's butchery to the northern boundary of the Penhalonga Proprietary Mines' ground. To the southward along the northern boundary line of the Pennaionga Proprietary Mines' ground. To the westward from the north-west beacon of the Penhalonga Proprietary Mines' ground to the south-east beacon of the hotel stand.

VICTORIA.—Description of the area.—A strip of land, half-a-mile in width, lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

SCHEDULE "C."

I, ...
residing at
in the district of in the
.....Colony, do solemnly and sincerely declare that the animals enumerated below are free from any contagious disease, including scab, and have not been in contact with any infected animals within six months from date hereof, and that to the best of my knowledge and belief such animals in travelling to* Station will not come in contact with any animals amongst which scab or any other contagious disease has existed during that period; further, that

such animals were thoroughly disinfected by dipping on..... and will enter Southern Rhodesia within ten days of having been dipped.

And I make this solemn declaration conscientiously believing the same to be true.

Declared to at on this day of before me.

.....

Resident Magistrate, Government Veterinary Surgeon, Scab Inspector, or Police Officer of district from which animals are being sent.

Number and general description of animals being sent

.....

Owner's name and Address

.....

Place in Southern Rhodesia to which animals are being sent

.....

* Station within Colony of origin.

CERTIFICATE ISSUED UNDER PROVISIONS OF SECTION I, GOVERNMENT NOTICE No. 295 OF 1908.

This is to certify that the animals enumerated below are, in my opinion, free from any destructive disease, including scab, and to the best of my knowledge and belief have not been in contact with any infected animals nor come from,or through, a locality where any such disease is known to exist or has existed for twelve months from date hereof.

Date.....

Place.....

.....

Signature of Government Veterinary Surgeon.

Number and general description of animals.....Pigs, ...Sheep, ...Goats.

Place from which animals are to be sent.....

.....

Owner's Name and Address

.....

Place in Southern Rhodesia to which it is desired to send the animals

.....

No. 110 of 1908.

Department of Agriculture,

Administrator's Office,

Salisbury, 16th April, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

(1) A permit shall be required from the Chief Inspector which may

contain such conditions as shall from time to time appear expedient.

(2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."

(3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.

(4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.

(5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcases thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.

(6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—

(1) Importation shall be through and direct from the Coast Ports of the Cape Colonies, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.

(2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.

4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcases, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.
GOVERNMENT NOTICE No. 110 OF 1908, SECTION 1 (2).

1. Applicant's Name and Address.....

2. Number and Class of cattle to be imported.....

3. Area or Farm and District where Cattle are at present located.....
.....

4. Area or Farm and District to which Cattle are to be moved.....
.....

Applicant's Signature.....

Date

Application

Permit No.

No. 60 of 1909.

Department of Agriculture

Administrator's Office,

Salisbury, 1st April, 1909.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal Government Notice No. 124 of 1908, and do hereby declare and make known that, notwithstanding anything to the contrary elsewhere provided, the importation of cattle for bona fide slaughter purposes may be permitted into the Umtali district from the adjoining Portuguese territory, under the following terms and conditions:—

(1) The importation and disposal of cattle, introduced in terms of these regulations, shall be under the absolute control and direction of the local Veterinary Surgeon or other duly appointed officer, and shall be regulated by the requirements of consumption.

(2) The importation shall be by rail only, and all cattle shall be detrucked at the slaughter enclosure and immediately confined therein.

(3) All cattle admitted to the slaughter area shall be immediately branded with the letters "V.D."

(4) All cattle admitted to the slaughter area shall be slaughtered within ten days of their admission, and under no pretext whatever shall cattle so admitted be permitted to leave the said area alive; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.

(5) No meat shall be removed from the said area without special permission unless it is entirely free from skin and ears.

(6) The hides of animals slaughtered in the said enclosure shall be immediately immersed in an approved insecticide for a period of not less than twelve hours, and shall not be removed from the said enclosure unless accompanied by a certificate signed by a Veterinary Surgeon that they have been satisfactorily disinfected and dried.

(7) Any person contravening the provisions of these regulations or the instructions or directions of the local Veterinary Surgeon or other duly authorised official, given in terms of these regulations, shall be liable, in respect of each offence, to a penalty not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, unless where more severe or heavier penalties have, by the aforesaid Ordinance, been expressly provided.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 268 of 1907.

Department of Agriculture,
The Treasury,
Salisbury, 26th December, 1907.

REMOVAL OF CATTLE FOR SALE.

NOTWITHSTANDING anything to the contrary contained in the Regulations published under Government Notices Nos. 188 of 1906 and 217 of 1907, I, under and by virtue of the powers conferred upon me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide as follows:—

1. The assembly of cattle for purposes of sale by auction or otherwise

may be permitted as such places and under such conditions as the Chief Inspector may from time to time prescribe.

2. The movement of cattle into the province of Mashonaland and the fiscal division of Gwelo from other places in Southern Rhodesia may be permitted under such conditions as the Chief Inspector may from time to time prescribe.

3. The granting of permits for the purposes of Sections 1 and 2 hereof and the nature of the conditions to be attached thereto shall be at the absolute discretion of the Chief Inspector.

4. Any person contravening the provisions of these Regulations or the conditions attached to permits issued thereunder shall be liable to a fine not exceeding £20, or, in dafault of payment, to imprisonment with or without hard labour for a period not exceeding three months .

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 216 of 1909.

Department of Agriculture,

Administrator's Office,

Salisbury, 23rd September, 1909.

MOVEMENT OF CATTLE, PROVINCE OF MASHONALAND AND DIVISION OF GWELO.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices No. 217 of 1907, Nos. 114 and 170 of 1908 and No. 199 of 1909, and so much of any other Regulation as may be repugnant to or inconsistent with the provisions of these Regulations, and declare that the following shall be of full force and effect in lieu, from date of publication, within the Province of Mashonaland and the Fiscal Division of Gwelo, as defined by the "Southern Rhodesia Boundary Regulations Amendment Regulations, 1898," which areas are hereby declared to be infected with a destructive disease:—

1. The movement of cattle within the said areas is prohibited save and except—

(*a*) on permission granted by an inspector or sub-inspector or other officer authorised by the Adminlstrator;

(*b*) within the boundaries of any single farm where such cattle are depastured;

(*c*) within any area enclosed by a substantial fence;

(*d*) within the boundaries of the various commonages, town lands or grazing ground common to any mining camp;

(*e*) for cattle the property of natives within a radius of four miles of their owners' kraal situate within the boundaries of any native location or reserve; the site of such kraal shall be deemed to be the place where it is situated at the date of publication hereof, and as is hereinafter further provided.

2. The movement of cattle for *bona fide* farming, breeding, mining, dairying, grazing and slaughter purposes may be permitted under the written authority of an official thereto duly authorised, subject to the following terms and conditions—

(*a*) the written permission of owners, occupiers or managers of all occupied lands, and, in the case of native reserves, of the Native Commissioner of the district over which cattle shall pass, is obtained; provided that, in the event of such owners, occupiers, managers or Native Commisssoners refusing to grant such permission, the Controller of Stock may direct the issue of a permit of removal if satisfied that the necessary permission is withheld without good and sufficient cause; and provided further that such permission shall not be required in respect of any movement of cattle within native districts or group of native districts as defined under Section 3 hereof, or in such districts or group of districts as may hereafter be defined, or in respect of movements authorised in terms of subsection (*c*) of the said Section;

(*b*) that such cattle shall, before being moved, be thoroughly dipped or sprayed to the satisfaction of the officer issuing the permit, and, if intended for slaughter, shall where possible be branded, under the supervision of the officer issuing the permit, with the letters "V.D." on the near hind quarter;

(*c*) that cattle intended for slaughter shall, on arrival at destination subject to the terms of clause (*d*) hereof, be immediately taken to the prescribed quarantine area and there be quarantined and confined, and, where not branded in terms of clause (*b*) hereof, be similarly branded under the supervision of a duly authorised officer;

(*d*) that all cattle intended for slaughter brought to their destination and not dipped or sprayed in terms of clause (*b*) hereof, shall be immediately thoroughly dipped or sprayed;

(*e*) that all cattle admitted to the quarantine area shall be slaughtered within twenty-one days of admission, and only be permitted to leave the area for the purpose of being driven to the abattoir for slaughter; and all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found outside the said area, at large or in possession of any person may be destroyed under an order of the Chief Inspector or Controller of Stock;

(*f*) that intermediate depots, or concentration camps, for slaughter stock may be allowed at centres approved of by the Chief Inspector of Cattle, provided that no such camp shall be situated within a less radius than five miles of any commonage, town lands, or grazing ground common to any mining camp, railway station or siding.

3. The movement of working cattle may be permitted under the written authority of an official thereto duly authorised—

(*g*) within the borders of the following native districts:—Gwelo, Hartley, Lomagundi, Marandellas, Melsetter, Selukwe and Umtali;

(*b*) within the following groups of native districts:—

(1) Charter and Chilimanzi;

(2) Mtoko, Mrewa, Makoni and Inyanga;

(3) Goromonzi' Mazoe and Darwin;

(4) Chilimanzi, Victoria, Ndanga and Chibi;

(*c*) between the Makondo Copper Mine in the Ndanga district and Karombe's Kraal in the Umtali district along the west bank of the Sabi river;

Provided that all cattle working under this section should be thoroughly dipped or sprayed every fourteen days, and provided that movements will be permitted for such periods as the Controller of Stock may in his discretion and on the advice of the Chief Inspector deem expedient, and that such permission may at any time be withdrawn or withheld without notice.

4. All applications for the removal of cattle from one native district to another shall be submitted for the approval of the Cattle Inspectors of the districts to and through which movements are made. All permits granted under the provisions of these regulations shall specify the number and brands of cattle, route to be traversed and time to be allowed for each journey, and uch other conditions as it may be deemed expedient to prescribe; and all uch permits shall be in the possession of the person travelling with or in harge of the cattle. Any breach of such conditions shall be deemed a con-ravention of the regulations in terms of section 9 hereof.

5. All veld-fed animals within the limits of the various commonages or town lands, or other centres where there is a common grazing ground and upon which public dipping tanks have been established, shall be dipped therein at least once every fourteen days; provided that the Controller of Stock may, an the advice of the Chief Inspector, direct the temporary suspension of this regulation for such reasons as he may regard as sufficient.

6. The following charges shall be paid at the time of dipping by the owner of the cattle or other animals required to be dipped under these regulations in respect of any dipping done at the public dipping tank:—

For horned cattle, 6 months and over	3d. per head.
For horses and mules	3d. „
For calves (under 6 months) and donkeys ...	2d. „
For small stock	½d. „

with a minimum charge of 6d. for any number of animals not aggregating such fee nnder the above tariff.

7. Any permit granted may be summarily suspended by any Inspector or Sub-Inspector or member of a police force finding cattle travelling under the same to be infested with ticks, and such officer may detain such cattle until such time as the animals have been cleansed to his satisfaction.

Any dipping or spraying required to be done under these regulations shall be carried ont with an approved tick-destroying agent by the owner of the animals; provided that the Inspector or Sub-Inspector may at his discretion

carry out such treatment at the entire cost of the owner of such animals.

The Controller of Stock may, on the advice of the Chief Inspector, direct the temporary suspension of dipping and spraying for such reasons as he may regard as sufficient.

8. Whenever the owner, occupier or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying or dipping or any other method permitted by these or any other regulations, the Cattle inspector may order such natives or others as have cattle on the same farm ta cleanse such cattle or any others before permitting them to enter or pass over such area, and the Native Commissioner of the district in which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle, at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

9. Any person contravening any of the provisions of these regulations shall, upon conviction, be liable, in respect of each offence, to the fines and punishment prescribed by the Ordinance; and, in the case where no special punishment is provided, to a fine not exceeding £20 or, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding three months unless the penalty is sooner paid.

F. J. NEWTON,

Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,

For Treasurer.

No. 356 of 1908.

Department of Agriculture,
Administrator's Office,
November, 1908.

MOVEMENT OF CATTLE INTO MATABELELAND.

NOTWITHSTANDING anything to the contrary contained in the Regulations published under Government Notices Nos. 188 of 1906 and 217 of 1907, I, under and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide as follows:—

1. The movement of cattle from the Province of Mashonaland into the Province of Matabeleland and from the Fiscal Division of Gwelo into other parts of Matabeleland may be permitted under such conditions as the Chief Inspector may from time to time prescribe, provided, however, that such movement shall not be permitted in respect of cattle imported from the country to the North of the Zambesi River until they shall have first remained for a period of at least twelve months in the Province of Mashonaland or the Fiscal Division of Gwelo.

2. The granting of permits for the purposes hereof, and the nature of the conditions to be attached thereto, shall be at the absolute discretion of the Chief Inspector.

3. Any person contravening the provisions of these regulations, or the conditions attached to permits issued thereunder, shall be liable to a

fine not exceeding £20, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No 39 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 11th March, 1909.

MOVEMENT OF CATTLE, PROVINCE OF MATABELELAND.

1. UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 188 of 1906 and 216 of 1907, and declare the following to be of full force and effect in lieu thereof within the province of Matabeleland, exclusive of the district of Gwelo, as described and defined by section 4 (c) of the Southern Rhodesian Boundary Regulations Amendment Regulations, 1898, which is hereby declared to be an area infected with a destructive disease, and is hereinafter called the said area.

2. The movement of all cattle within the said area is prohibited save and except

(a) on permission granted by the local Cattle Inspector;

(b) within the boundaries of any single farm where such cattle are depastured;

(c) within an area of land enclosed by a substantial fence;

(d) within a radius of four miles from any native kraal situate within the boundaries of any native location or reserve, and as hereinafter further provided.

3. The movement of cattle for slaughter, grazing, bona fide farming, mining or breeding purposes, or for private milk supplies, shall be permitted under the written authority of an official thereto duly authorised, subject to the following terms and conditions:—

(a) that the written permission of owners, occupiers, or managers of all occupied land, and in the case of native reserves, of the Native Commissioner of the district over which such cattle shall pass, is first obtained; provided that in the event of such owners, occupiers, managers or Native Commissioners refusing to grant permission, the Controller of Stock may direct the issue of a permit of removal, if satisfied that the necessary permission is withheld without good and sufficient cause;

(b) that such cattle shall, before being moved, be thoroughly disinfected by dipping or spraying, to the satisfaction of the officer issuing the permit, and at the expense of the owner of such

stock, and, if intended for slaughter, shall where possible be branded, under the supervision of the officer issuing the permit, with the letters "V.D." on the near side of the neck;

(c) that cattle intended for slaughter, shall, on arrival at destination, subject to the terms of clause (d) hereof, be immediately taken to the prescribed quarantine area and there be quarantined and confined, and, where not branded in terms of clause (b) hereof, be similarly branded under the supervision of a duly authorised officer;

(d) that all cattle intended for slaughter brought to their destination and not disinfected by dipping or spraying, in terms of clause (b) hereof, shall be immediately taken to the public dipping station and there be thoroughly dipped or sprayed before being taken to the quarantine area;

(e) that all cattle admitted to the quarantine area shall be slaughtered within twenty-one days of the admission, and only be permitted to leave the area for the purpose of being driven to the abattoir for slaughter; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area, or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.

4. The movement of working cattle may be permitted under the following conditions only:—

Within the said area from private farms, mines and trading stations to any centre of consumption, or to or from a railway station or siding, or to and from any other farm under the permit of a duly authorised officer, which permit shall fully set forth the route to be traversed; provided that no permit shall be issued until the person applying for the same shall produce the written consent of owners, occupiers or managers of occupied lands proposed to be traversed, and in the case of native reserves, of the Native Commissioners, and that such cattle, before being moved, be thoroughly disinfected by dipping or spraying at the expense of the owner, and to the satisfaction of the officer issuing the permit; provided, further, that in the event of such consent being unreasonably withheld, the Controller of Stock may direct the issue of a permit.

5. All applications for the removal of cattle from one native district to another shall be submitted for the approval of the Government Veterinary Surgeon at Bulawayo and the Cattle Inspector of the district to which the removal is to be made.

6. All permits granted under the provisions of this notice shall specify the number and brands of cattle, route to be traversed, and time allowed for each journey. Any breach of these or other conditions endorsed on the permit by the issuing officer shall be deemed a contravention of these Regulations, in terms of section 9 hereof.

7. All veld-fed animals within the limits of the various commonages or townlands, or other centres where there is a common grazing ground and upon which public dipping tanks have been established, shall be dipped therein at least once every fourteen days; provided that the Controller of Stock may, on the advice of the Veterinary Department, direct the

temporary suspension of this Regulation, for such reasons as he may regard as sufficient.

8. The following charges shall be paid at the time of dipping by the owner of the cattle or other animals required to be dipped under these Regulations, in respect of any dipping done at a public dipping tank:—

For Cattle (over six months)	3d.	per head.
,, Horses and Mules	3d.	,,
,, Calves (six months and under)	2d.	,,
,, Small Stock	½d.	,,

with a minimum charge of 6d. for any number of animals not aggregating such fee under tariff.

9. Any disinfecting by spraying required to be done under these Regulations shall be carried out with an approved insecticide by the owner of the animals so sprayed; provided that the Inspector may, at his discretion, carry out such disinfection, with the assistance of and at the entire cost of the owners of the animals sprayed, the cost of such disinfection being payable at the time of the spraying.

10. Any person contravening any of the provisions of these Regulations shall, upon conviction, be liable, in respect of each offence, to the fines and punishments prescribed by the Ordinance; and, in the cases where no special punishment is provided, to a fine not exceeding £20; or, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding three months, unless the penalty be sooner paid.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 101 of 1909.

Department of Agriculture,
Administrator's Office,
Salisury, 19th May, 1909.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the disease amongst live stock, due to the organism known as Trypanosoma Dimorphon, to be a destructive disease within the meaning of the said Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 102 of 1909.

Department of Agriculture,

Administrator's Office,

Salisbury, 19th May, 1909.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the native district of Hartley, as bounded and described in Government Notice No. 13 of 1899, to be an area infected with the disease amongst live stock due to the organism known as Trypanosoma Dimorphon, which disease has, by Government Notice No. 101 of 1909, been declared a destructive disease within the meaning of the said Ordinance.

And I do further declare and make known that until further notice no animal within the meaning of the Ordinance shall be permitted to be moved from within the said area to any place without the said area.

Provided, however, that animals in transit by rail, coming from beyond the limits of the said district, shall be allowed to pass through the district, if not removed from the trucks in which they are being conveyed within the limits of the said district.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON.
Treasurer.

No. 244 of 1909.

Department of Agriculture,

Administrator's Office,

Salisbury, 4th November, 1909.

HARTLEY DISTRICT.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw that portion of Government Notice No. 102 of 1909 declaring the native district of Hartley, as bounded and described in Government Notice No. 13 of 1899, to be an area infected with the disease amongst live stock due to the organism known as *Typanasoma Dimorphon*, and in lieu thereof declare the following area to be so infected:—

That portion of the native district of Hartley within the following boundaries:—

From the junction of the Umniati and Umfuli Rivers in a southerly and south-easterly direction, along the western and southern boundaries of the Lomagundi district to the Hunyani River; thence easterly up the Hunyani

River to its intersection by the old Hartley road; thence in a south-westerly direction to its junction with old Hunter's road; thence in a southerly direction along old Hunter's road to its intersection with the Ngezi; thence in a westerly direction down the Ngezi River to its junction with the Umniati River; thence down the Umniati River to its junction with the Umfuli River.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No 45 of 1909.

Administrator's Office,
Salisbury, 13th March, 1909.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 156 and 228, of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcases of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. In the event of any outbreak of rabies occurring, all owners of dogs within fifteen miles of such outbreak, or such other area as may be fixed, shall, on notification by any of the above-mentioned officials, or by Government Notice in the "Gazette," at once place and keep their dogs in a safe enclosure, or chained up, for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash held by the person exercising them.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 277 of 1909.

Department of Agriculture,

Administrator's Office,

Salisbury, 2nd December, 1909.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of section 11 of Government Notice No. 45 of 1909 to be in force over the areas (1) within a radius of 15 miles of Nyakudamda's Kraal, (2) within a radius of 15 miles of Mount Numan Mine, (3) within a radius of 15 miles of Makoni's Kraal, all within the district of Mtoko, for a period of six weeks from date of publication hereof.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 249 of 1908.

The Treasury,

Salisbury, 27th August, 1908.

PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON.
Treasurer.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

(a) Birds and Small Buck.

(b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tasessibe, Waterbuck and Wildebeest.

(c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—

In Mashonaland:

Birds from 1st May to 30th September.

Small Buck from 1st May to 31st October.

In Matabeleland:

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Secretary for Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Secretary for Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 40 of 1909, amended by No. 128 of 1909, withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1910, and transfers from Class "C" to Class "B" Eland, Koodoo, and Zebra so far as that area is concerned. Under Government Notice No. 129 of 1909 game in Class "B" may be shot without a licence in this area.

Game in Class "A" may be hunted in the close season ending 30th April, 1909, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Salisbury, Bulawayo, Umtali and Melsetter; within a radius of two miles of the Court House, Gwelo,

or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

No. 128 of 1909.

Department of Agriculture,

Administrator's Office,

Salisbury, 10th June, 1909.

GAME LAW CONSOLIDATION ORDINANCE, 1906.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby declare and make known that the area described in section 1 of Government Notice No. 40 of 1909 shall be extended and include the area bounded as follows:—

From the Railway bridge on the Umfuli River thence north-westwards along the Umfuli River to where it joins the Umniati River, thence south-wards along the Umniati River to where it joins the Umsweswe River, thence eastwards along the Umsweswe River up to the drift at the Lydia Mine, thence along the old road from Lydia Mine to Etna Mine and to Inez Mine, thence northwards along the road from Inez Mine to Hartley, thence in the direction of the Railway bridge to the starting point on the Umfuli River.

F. J. NEWTON,

Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,

For Treasurer.

No. 129 of 1909.

Department of Agriculture,

Administrator's Office,

Salisbury, 10th June, 1909.

UNDER and by virtue of the powers vested in me by sub-section (2) of section 4 of the "Game Law Consolidation Ordinance, 1906." I do hereby suspend the operation of sections 5 and 12 of the said Ordinance in regard to all game in Class "B" and the following game in

Class "C," viz., eland, koodoo, zebra and Burchell's zebra or quagga, within the area described in section 1 of Government Notice No. 40 of 1909, as amended by Government Notice No. 128 of 1909.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council..

P. D. L. FYNN,
For Treasurer.

Ordinance No. 1, 1908.] [Promulgated 18th December, 1908.

SOUTHERN RHODESIA.

AN ORDINANCE TO FURTHER AMEND THE LAW WITH REFERENCE TO THE BRANDING OF STOCK.

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

1. Sections 7, 8, 9, 10 and 13 of "The Brands Ordinance, 1900" (herem after referred to as the said Ordinance), and so much of any other law as is repugnant to or inconsistent with the provisions of this Ordinance are hereby repealed; but such repeal shall not be taken to affect the validity of any brand duly registered at the time of coming into operation of this Ordinance.

2. No person shall have the right of claiming to have any special form or design of brand allotted to him, but any person requiring a brand shall, on application, and on payment of the prescribed fee, have a brand allotted to him by the Registrar.

3. Section 23 of the said Ordinance is hereby amended by the addition of the following sub-section:—

"(6) The system and procedure to be observed by the Registrar in allotting brands."

4. This Ordinance may be cited for all purposes as the "Brands Ordinance Amendment Ordinance, 1908."

Above is the text of the Ordinance passed during the last Session of the Legislative Council, the object of the Ordinance being to so amend the Brands Ordinance, 1900, as to permit of the system of branding known as the "Three piece system."

Following are the regulations promulgated under the Ordinance, and which brought the new system of registration into operation on 7th January, 1909.

No. 391* of 1908.

Department of Agriculture,

Administrator's Office,

Salisbury, 17th December, 1908.

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdrew the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

* Republished with corrections.

9. There shall be payable to the Registrar or Deputy Registrar:—

(a) For every separate registration of a brand, 5s.

(b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next in order, according to the following table:—

i. Off Neck or Rump (or Thigh);

ii. Near Shoulder (or Top of Arm);

iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

i. Off Rump (or Thigh);

ii Near Shoulder (or Top of Arm);

iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

i. On Near Side or Ribs;

ii. Near Rump (or Thigh);

iii. Off Shoulder;

iv. Off Side or Ribs;

v. Off Rump (or Thigh).

(d) In the case of ostriches:—

i. On Near Thigh;

ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette."

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the provisions of this section shall on conviction be liable to a fine not exceeding £5.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

P. D. L. FYNN,
Acting Treasurer.

SCHEDULE A.

APPLICATION FOR A BRAND.

Brands Ordinance, 1900, and Brands Ordinance Amendment Ordinance, 1908.

To the Deputy Registrar,

.....

Herewith we enclose the prescribed fee of.....and request that you will allot and register a brand for the holding or place mentioned in the Schedule below.

Name of Applicant in full.	Address.	District or Sub-district for which Brand is required.

Date.....

.....

Applicant.

SCHEDULE B.

Brands Ordinance, 1900, and Brands Ordinance Amendment Ordinance, 1908.

No.....

..... day of

I hereby certify that the brand shown in the diagram at foot hereof was duly registered on the date and as the brand of the person(s) therein set forth in the schedule hereto.

Owner(s)' full Name.	Address.	District for which Brand is registered.	Date of Registration.

Fee paid.....

Diagram of Brand.....

(Signed).....

Registrar of Brands.

SCHEDULE C.

MEMORANDUM OF TRANSFER OF BRAND.

Brands Ordinance, 1900, and Brands Ordinance Amendment Ordinance, 1908.

We,.....being the registered owner(s) of the brand set forth in the schedule hereto, do hereby agree to the transfer of the same to.....of.....and hereby request that the same may be registered accordingly. And we....., the second undersigned, do also hereby agree to the said transfer and enclose the fee therefor (..... Shillings).

Witness..... Owner.

Address.....

.....

Witness..... Transferee.

Address.....

.....

Brand.	Name and Address of Registered Owner of Brand.	District where Brand is Registered.	No. of Certificate.	Date of Registration.

.....

No. 220 of 1909.

Department of Agriculture,

Administrator's Office,

Salisbury, 30th September, 1909.

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by the "Brand Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby declare that the following district has been added to those shewn in Schedule "F" of Government Notice No. 391 of 1908, and brands allotted as under:—

Dominant Letter or Numeral.	District denoted.	Brands Series.
3	Darwin.	$\frac{3}{AA}$ and variations.
		$\frac{3}{ZZ}$

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,
For Treasurer.

No. 228 of 1909.

Department of Agriculture,

Administrator's Office,

Salisbury, 7th October, 1909.

WHEREAS the disease known as "foul brood" exists, or is supposed to exist, among bees in Australia, New Zealand, and the continent of America, including the West Indies, and the continent of Europe, including Great Britain and Ireland:

Now, therefore, under and by virtue of the powers vested in me by the "Injurious Substances and Animals Ordinance, 1909," I do hereby declare and make known that—

1. From and after this date it shall not be lawful for any person to introduce or cause to be introduced into Southern Rhodesia, except with the written permission of the Director of Agriculture, and subject to the production, in the case of each consignment, of sworn declarations in accordance with the forms set forth in the annexures contained in the schedule hereto, as the case may require, bees, beeswax, foundation comb, honey, used beehives, or used beehive accessories or appliances, or any article or thing that has been used to contain or manipulate bees or beeswax.

2. The above prohibition shall not apply to the introduction of bees, beeswax, foundation comb, honey, used beehives or beehive accessories from any neighbouring Colony or State which shall by its own regulations have prohibited the importation of bees, beeswax, foundation comb, honey, used beehives or beehive accessories, subject to the aforesaid exemption to any neighbouring Colony or State.

3. Any bees, beeswax, foundation comb, honey, used beehives or beehive accessories unlawfully imported, or imported otherwise than in accordance with the provisions of these regulations, or found to be affected with any disease, shall be liable to immediate confiscation and destruction, or to be quarantined at the expense of the owner until, in the opinion of the Director of Agriculture, any source of danger has been removed or has disappeared.

4. Any person contravening the provisions of these regulations, or any directions or instructions given in terms of these regulations, shall be liable in respect of each offence to a fine not exceeding £100, or in default of payment thereof to imprisonment, with or without hard labour, for a period not exceeding one year.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,
For Treasurer.

SCHEDULE.

ANNEXURE "A."

Form of Declaration required to accompany Importation of Bees.

I / We do solemnly and sincerely declare that the undermentioned Bees were supplied by me / us to..... of.....on.....and that no Bee disease of any description exists on our premises or within two miles (three kilometres) thereof.

And I / we make this solemn declaration conscientiously believing the same to be true.

.....

Declared at.....this..... ...day of 19.....

Before me,

.....

Justice of the Peace
or other Officer authorised
to administer oaths.

Number of Bees referred to in this Declaration.....

ANNEXURE "B."

Form of Declaration required to accompany Importation of Beeswax.

I/We do hereby solemnly and sincerely declare that the undermentioned Beeswax supplied by me/us to.....of.....on.....has been melted for not less than two and a half hours, at a temperature of not less than 212 degrees Fahr., and has not subsequently been on premises, or within two miles of premises, where Bee disease of any description is known to exist.

And I/we make this solemn declaration conscientiously believing the same to be true.

.....

Declared at.....this.....day of 19.....

Before me,

.....

Justice of the Peace
or other Officer authorised
to administer oaths.

Quantity of Beeswax referred to in this Declaration

ANNEXURE "C."

Form of Declaration required to accompany Importations of Foundation Comb.

I/We do hereby solemnly and sincerely declare that the undermentioned Foundation Comb supplied by me/us to.....of.....on.....has been made from Beeswax that has been melted for not less than two and a half

hours, at a temperature of not less than 212 degrees Fahr., and has not subsequently been on premises, or within two miles of premises, where Bee disease of any description is known to exist.

And $\frac{I}{we}$ make this solemn declaration conscientiously believing the same to be true.

.....

Declared at.....this.....day of

.....19.....

Before me,

.....

Justice of the Peace or other Officer authorised to administer oaths.

Quantity of Foundation Comb referred to in this Declaration.....

No. 52 of 1909.

Department of Agriculture,

Administrator's Office,

Salisbury, 25th March, 1909.

CONDITIONS UNDER WHICH GOVERNMENT VETERINARY SURGEON'S SERVICES ARE AVAILABLE TO THE PUBLIC.

1. ON and after 1st April, 1909, the services of Government Veterinary Surgeons will be available to the public, free of charge for the following purposes only:—

(1) Attending and giving professional advice in connection with the following diseases, viz.:—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Footrot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lung-sickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

(2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

(3) Inoculations against the following diseases:—

Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz.:—

	£	s.	d.
(1) For every professional visit within three miles of his office or residence	0	5	0
(2) For every professional visit beyond such distance plus an additional charge of 2s. 6d per hour whilst engaged in such visits, or £2 2s. a day of 24 hours;	0	10	6
(3) For advice given at the Veterinary Surgeon's office, for each animal, per visit	0	2	6
(4) The following to be charged in addition to visiting fees:—			
a. For every examination as to soundness, each	1	1	0
b. For castration, horses, each	1	1	0
c. ,, bulls ,, ...	0	5	0
d. ,, donkeys ,, ...	0	10	6
e. For parturition cases, mares, each	2	2	0
f. For parturition cases, cows, each	1	1	0
g. For other operations, according to nature, from 5s. to £2 2s.			

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government veterinary surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government veterinary surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the veterinary surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government veterinary surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government veterinary surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government veterinary surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 136 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 1st July, 1909.

FENCING ORDINANCE, 1904.

UNDER and by virtue of the powers in me vested by section 26 of the "Fencing Ordinance, 1904," I do hereby declare that the subjoined Regulations, providing for the erection and closing of gates, shall be applied in any district or area coming under the provisions of the said Ordinance.

1. On and after the "Fencing Ordinance of 1904," becoming operative in any district or area, any owner of land erecting a dividing fence under the provisions of the Ordinance within such area, shall erect swing gates on all existing private or public roads crossed by such fence.

2. The gate and its appurtenances shall be of such size and description as the Civil Commissioner of the district shall fix and determine.

3. A gate shall not be hung on any straining post, but shall be hung on strong posts erected for the purpose, in such a manner as to allow of it being swung evenly on its hinges, clear of the road, and inwards and outwards.

4. Every person or traveller after passing through a gate, shall properly close such gate, according to the provision made for the purpose.

5. No livestock enclosed in a dividing fence shall be allowed to stray through a gate while any person or traveller may be passing through.

6. Any person contravening any of the above Regulations shall be liable to a penalty not exceeding ten pounds for each offence, or in default of payment of the fine imposed, to imprisonment for any period not exceeding one month, with or without hard labour.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,
For Treasurer.

No. 281 of 1909.

Department of Agriculture,

Administrator's Office,

Salisbury, 2nd December, 1909.

UNDER and by virtue of the powers vested in me by section 8, sub-section (1) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the removal of the following articles from areas known or suspected to be infected with any destructive disease:—

Skins, hides, green forage, hay of any sort, fodder, bedding, reeds, kraal or stable manure, or any article which may reasonably be supposed to convey infection, or infective insects.

Any person removing articles in contravention of the aforesaid prohibition shall be liable to the penalties on that behalf provided and to have such articles destroyed, in terms of section 5, sub-section (6) (a) of the aforesaid Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 262 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 25th November, 1909.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidated Ordinance, 1904," I do hereby cancel Annexure "B" referred to in sub-section (2) of section 1 of Government Notice 110 of 1908, as amended by Government Notice No. 87 of 1909, and in place thereof do substitute the following, which shall, from date of publication hereof, be the form required to accompany Annexure "A," also referred to in aforementioned sub-section.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

ANNEXURE "B."

I,.....

residing on the farm

in.....do solemnly and sincerely declare that the..... (numbered in writing) animals also enumerated below have been in my possession since birth, and that lung-sickness, pleuro-pneumonia or other contagious or infectious disease has not existed amongst any of my cattle, nor on my farm, nor among any cattle with which these animals have been in contact within the last four years, and that these animals have never been exposed for sale in any public market or stock fair, nor been in contact with strange cattle, and that to the best of my knowledge and belief such cattle in travelling to Station (*i.e.*, station where cattle are to be trucked) will not come into contact with any animals amongst which lung-sickness or any other contagious or infectious disease has existed during that period.

Number of Animals.....Bulls..... Heifers.....

Breed.....

Seller's Name and Address.....

.....

Purchaser's Name

Place in Southern Rhodesia to which animals are being sent

.....

And I make this solemn declaration conscientiously believing the same to be true.

.....

Declared to at.....on this.....

day of.....before me,

.....

Resident Magistrate for the district of

.....

No. 260 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 25th November, 1909.

Game in Class A, Melsetter.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby declare that the operation of section 12 of the said Ordinance shall be suspended in regard to game in Class A until further notice, on private land within the magisterial district of Melsetter, subject to the provisions of section 16 of the said Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 263 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 25th November, 1909.

IMPORTATION OF SWINE.

NOTWITHSTANDING the prohibition which exists under section 1 subsection 3 of Government Notice No. 295 of 1908 against the importation of swine from the Colony of the Cape of Good Hope, I, under and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide that swine may be imported from the Cape of Good Hope under a permit issued by the Chief Inspector or Examiner of Stock, and subject to any examination and quarantine on entry that may be necessary, and to such other conditions as may be deemed expedient to attach to such importations.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 264. of 1909.

Department of Agriculture.
Administrator's Office,
Salisbury, 25th November, 1909.

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of horns and raw hides of cattle from the Bechuanaland Protectorate.

Any horns or hides introduced in contravention of this prohibition shall be confiscated and destroyed.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 265 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 27th November, 1909.

POUND AT SALISBURY.

UNDER and by virtue ot the powers conferred on me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I hereby abolish the pound established in the Municipality of Salisbury, in terms of Government Notice No. 99 of the 2nd April, 1908, and appoint in lieu thereof, from the 1st proximo, a Pound at the Government Transport Camp at Salisbury.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator,

F. J. NEWTON,
Treasurer.

No. 255 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 18th November, 1909.

RABIES.

UNDER and by virtue of the power vested in me by the "Animal Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of section 11 of Government Notice No. 45 of 1909 to be in force over the area within a radius of fifteen milies of Mr. G. A. Maclaurin's homestead on the farm Great B, Mazoe district, for a period of six weeks, from and including the 11th day of November, 1909.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F, J. NEWTON,
Treasurer.

No. 261 of 1909.

Departure of Agriculture.
Administrator's Office,
Salisbury, 25th November, 1909.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of section 11 of Government Notice No. 45 of 1909 to be in force over the area within a radius of fifteen miles of the Native Commissioner's station at Mrewa, for a period of six weeks from the date of publication hereof.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

Department of Posts and Telegraphs,

Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EYRE,
Postmaster General.

General Post Office, Salisbury,
20th July, 1909.

South African Stud Book

A RECORD of all classes of Stock, the object being to encourage the breeding of Thoroughbred Stock, and to maintain the purity of breeds, hus enhancing their value to the individual owner and to the country generally.

Applications for Membership, and entries of Stook should be addressed:

For Cape Colony to

A. A. PERSSE, P.O. Box 703, CAPE TOWN.

For Transvaal to

F. T. NICHOLSON, P.O. Box 134, PRETORIA.

For the Orange River Colony

E. J. MACMILLAN, Government Buildings,
BLOEMFONTEIN.

A. A. PERSSE,
Secretary South African
Stud Book Association.

AFRICANDER BULLS.

Three Pure Bred Africander Bulls for Sale, two 4-tooth and one 6-tooth respectively.—R. Bliss, Ayrshire.

PERSIAN SHEEP RAMS.

These Rams are all picked from our well-known Longhope Stud; winners of over 100 prizes—Port Elizabeth, Rosebank, and Bloemfontein.

I have now a portion of this stud on my farm, near Penhalonga, Rhodesia, and am open to take orders for Rams now on hand, and also to book for next year. Price, £3 10s. on truck, Umtali.—Apply, Douglas Abrahamson, Penhalonga.

BERKSHIRE PIGS

From imported strains. Orders booked and on hand from progeny pure bred prize winners. Prices from 40s. The best obtainable. Winners of Firsts: Queenstown 1908, Bulawayo, Gwelo 1908, Salisbury 1908-9.—Apply, J. Arnold Edmonds, Glen Lorne, Salisbury.

MESSRS. MACLAURIN BROS.

(Breeders of Pedigree Friesland Cattle.)

Orders are being booked for young pure-bred Friesland Bulls bred by pedigree sire and dam.

These Bulls are bred and reared on the Farm Pomona, near Salisbury, a Redwater area, and thus farmers may obtain highly bred animals without the usual risks attending importation and immunising.

Particulars of pedigree and prices will be obtained on application to Messrs. Maclaurin Bros., Salisbury.

THE RHODESIAN

AGRICULTURAL JOURNAL

Edited by the Director of Agriculture
assisted by the Staff of the Agricultural Department.

VOL. VII.—NO. 3.] FEBRUARY, 1910 [5s. per annum.

TRYPANOSOMIASIS.—The report in the present issue of the Journal by Mr. Ll. E. W. Bevan, M.R.C.V.S., on the Animal Trypanosomiasis of Southern Rhodesia is a valuable contribution to the study of Trypanosomiasis generally, and especially to one of the forms with which we have to deal in Southern Rhodesia.

Until recently our knowledge on this subject was limited to the fact that trypanosomiasis amongst domestic animals occurred in various districts in Southern Rhodesia, and caused a considerable loss to stock owners, and interference with farming and mining operations. The type of infection was generally regarded as that known as "Nagana," the "Fly disease" of Zululand caused by Trypanosoma Brucei. The discovery in 1908 by Montgomery and Kinghorn of Trypanosoma dimorphon at Broken Hill, and the theory advanced by these observers that it could be transmitted by ordinary biting flies, followed by Dr. Theiler's statement that he had found the same parasite in blood smears from sick cattle in the Hartley district naturally caused this Department to turn its attention to the disease in the vicinity.

The observations and experiments on the local type of dis-

ease have naturally been compared with the results of the investigations at Broken Hill, and attention is drawn to the following important points in the paper:—

THE ASSOCIATION OF TSETSE FLY AND DISEASE IN STOCK. —The observations on this point is as satisfactory evidence as is possible to obtain from clinical and field work that the type of Trypanosomiasis which exists in Southern Rhodesia is transmissable in nature by tsetse flies only.

The cases observed in most lots of cattle introduced via Feira are accounted for by exposure in fly belts *en route.* Particular reference is made to the cattle now under observation in the Lomagundi District and to a large mob brought to Borrowdale about two years ago. To this can be added the experience of Mr. Peake, Eldorado Mine, who informed us recently that during the last ten years he has mixed many Northern cattle affected with fly disease amongst his breeding cattle but has never had a single case of fly disease amongst the latter.

Several instances are given of clean cattle having been herded with or grazing close to diseased cattle without spread of infection, the most important of which is the presence of 18 infected cattle on the farm Hippovale on the South bank of the Umfali River, whilst directly opposite and within three miles there are about 400 head of transport. cattle amongst which there has not been a single case of disease.

ANIMALS NATURALLY SUSCEPTIBLE.— The reports of other observers show that horses, cattle (especially calves) are susceptible to natural infection by Trypanosoma dimorphon.

In Hartley district big cattle are practically the only victims, not a single naturally infected calf has been detected so far, even in fly belts, nor have any cases amongst equines been reported.

CLINICAL SYMPTOMS.— An important difference is to be noted between some of the symptoms shewn by Hartley

animals and those described by Montgomery in N.W. Rhodesian cattle. in the latter "weakness and pariesis of the hind limbs are not common," whilst in the former they are so constantly present as to be practically diagnostic. Montgomery and Kinghorn state that in North Western Rhodesia "it seems possible that iin a few cattle a chronic form is established." Mr. Bevan states that "in this country it would appear that a large proportion of cattle survive the acute stage and take on a sub-acute or chronic form." Amongst the Northern cattle in Lomagundi district the chronic form of the disease is very prevalent and recovery is not at all uncommon. It may be that the virulence and duration of the disease depend on the severity of infection.

LABORATORY INVESTIGATIONS—This is the most important and interesting part of the report, particularly the description of the morphology of the Hartley parasite, its comparison with others and the results obtained by passage through various animals.

The greatest confusion exists at present as to Trypanosoma dimorphon. Dutton and Todd discovered this parasite in horses in Gambia in 1902 and came to the conclusion that cattle and other domestic animals did not suffer from it.

Since then Trypanosoma dimorphon has become quite fashionable. It has been discovered in all the domestic animals, and in some antelopes, in various parts of Africa. It would be difficult at the present time however to get any two observers to agree on the morphology and classification of any given specimen of a "dimorphic type."

In Mr. Bevan's description of the Hartley form of Trypanosome a most important point is noted in connection with the "tadpole form:" In naturally infected cases this has not been frequently met with, whilst Montgomery and Kinghorn state it predominates in all animals except during the last few days of life in a few cases. There is a difficulty in the interpretation of the term "tadpole," but as Montgomery and Kinghorn refer so frequently to Dutton and Todd's work there is little doubt that their "tadpole" form and Mr. Bevan's are the same.

The morphology of the parasite was also studied in sub-inoculations and most important differences were observed in the sheep and rat.

It would appear also from the experiments made that the Hartley disease is different to that investigated in Portuguese East Africa by Theiiler.

At present it is impossible to say what Trypanosome we have to deal with in the Hartley district, further work is necessary to determine it. It is not altogether the question of the Hartley trypanosome, many others of a similar nature have to be investigated and each assigned its proper place in the family tree.

These remarks are not intended as a summary of the report, but to direct attention to the marked differences which exists in the disease we have to deal with at Hartley at that described by Montgomery and Kinghorn at Broken Hill.

SUMMARY OF THE POSITION.—The whole position may be summarised as follows:—

1. Montgomery and Kinghorn found a Trypanosomiasis caused by Trypanosoma dimorphon at Broken Hill and
2. Advanced the theory that infestion is transmissible through the medium of ordinary biting flies.
3. Theiler finds trypanosomes in blood smears from cattle in the Hartley and Wankie districts, which he states are Trypanosoma dimorphon.
4. Theiler subsequently modified his opinion, and classes the Hartley trypanosome as of "Dimorphic type."
5. Bevan demonstrates (a) marked morphological difference between the Hartley and Broken Hill trypanosomes (b) important differences in the clinical symptoms presented by cattle and sheep (c) a difference in the resistance of the smaller experimental animals not referred to here.
6. Various instances are recorded where animals suffering from the Hartley type of disease have been herded

for long periods with clean cattle and no case of disease has resulted.

7. The instances given by Montgomery in support of infection other than by tsetse flies are not conclusive. The possibility of contact with Tsetse cannot be eliminated in any one of them.

After careful consideration it appears to the writer that the Hartley disease, whether caused by Trypanosoma dimorphon, a Dimorphic trypanosome, or a new species, is different from the Broken Hill type and is transmissible by tsetse flies only.

Acting on this view it has been decided to modify the restrictions imposed upon all animals in Hartley district some months ago: It should be clearly understood that these were enforced because of the suspected existence of Trypanosoma dimorphon and the suggestion that it could be transmitted by ordinary biting flies.

The regulations have been cancelled and in future cattle in or near fly belts will be confined to their respective grazing or working areas under the general provisions of the Animal Diseases Consolidated Ordinance. J.M.S.

THE EXPORT OF MAIZE.—We are glad to be able to announce that the first shipment of maize from Southern Rhodesia has been attended with success. The experiment was watched with keen attention by all parties concerned, and our readers will be interested to learn that the average price realised for the ten thousand bags was 25/- per quarter c.i.f., London, or approximately 10/5 per bag. Owing to a slight rise in market prices, a small part of the shipment sold at a somewhat higher figure.

In view of the fact that the maize was exported at very short notice, and further that the European market had no previous experience of Rhodesian maize, the Salisbury Co-operative Society are to be congratulated on the success of their venture.

In many respects it would have been more desirable had the first shipment been of outstandingly good qualaity, this however, under the circumstances, was not possible. It therefore remains for us to benefit by the experience which has been gained and we know that with proper attention we can export a better sample still.

It is instructive to note that the comments passed on this maize by European buyers entirely corroborate the defects which were called attention to in "A Criticism of Rhodesian Maize," appearing in this Journal, Vol. VII., No. 1, page 801.

Reports have been kindly furnished by the Secretary of the London Corn Exchange, and by one of the largest grain dealing firms in Great Britain, and may be briefly summarised as follows :—The quality of the maize is extremely good and is that required by the manufacturer and distiller but there is some irregularity in the size and variety of the maize. As a general rule it would suit buyers better were it of one bulk and one sample throughout. It should be pointed out that the aim as far as possible should be to produce a uniform standard as regards cleanliness, variety, and size of berry. Some of the maize has been a little imperfectly cleaned, and shows a greater quantity of cob and husk than is liked. A large number of bags seem to average about 212 lbs nett weight. The bags were in good condition, and appear to have carried well. On analysis we think your maize will compare favourably with maize received from other parts of the world, and in that case should always command a good sale both here and on the Continent. This consignment has been sold to a very large firm of manufacturers, and if good and regular supplies of a uniform standard could be shipped there would be a steady demand for Rhodesian white flat maize.

The points which are emphasised as requiring careful attention are as follows:—

(a) That the maize should be better graded.

(b) That it should be made freer of husks and fragments of cob.

(c) That it be packed in bags of even and uniform weight, if possible not exceeding 202 lbs. gross.

(d) That the size of berry varies too much, and that the proportion of husk is too high.

(e) Finally, that if Rhodesian maize is to establish a thoroughly good name in the European market, it is of the utmost importance that uniformity of variety and cleanliness should be observed.

We are officially informed that in view of experience gained in shipping this trial consignment it will be necessary from 1st January until further notice to increase the tariff for railage freight landing charges and sale from 2/6 to 2/9 per bag.

The farmers and Co-operative Society may be congratulated on the results of the experiment both as regards the information gained and the profit of the venture.

CHEMIST TO THE DEPARTMENT OF AGRICULTURE.—The strength of the Agricultural Department and its power to assist farmers in practical ways has been increased by the arrival on the 1st January, 1910, of an agricultural analyst, who has been installed at the Agricultural Laboratories along with the agriculturist and botanist, the entomologist and the officer engaged in veterinary research. The chemist will take up the study of the nature and composition of our soils, crops and natural products, grains, oilseeds, poisonous plants milk and economic materials of possible commercial value. The problems of soil exhaustion, and maintenance and increase of fertility also demand attention and there are no lack of other subjects upon which the services of a chemist can be very beneficially directed.

Mr. Blackshaw, after several years of agricultural chemical work at the School of Agriculture, Elsenburg, Cape Colony, paid a visit to America and England to investigate on the spot the latest advances of his special branch of science, and

comes direct thence to Rhodesia with the fullest and latest information, and we now look to benefit by his exceptional and valuable knowledge. Further particulars on this head will be found under "Departmental Notices."

AN ADDITIONAL VETERINARY SURGEON. — Farmers will join with us in welcoming Mr. J. D. Ferguson, M.R.C.V.S., who arrived on the 21st January in Salisbury to supplement the veterinary staff. Still further additions are contemplated. The peculiar conditions of South Africa render it necessary for veterinary surgeons to undergo an initiatory period of adaptation to new environments. Mr. Ferguson has already had some experience of South Africa also of the Canadian North West. He is a graduate of the Royal Veterinary College, Dublin.

Mr. Stirling, M.R.C.V.S., recently went home on serious and urgent private affairs but is expected back in Rhodesia ere long.

THE SOUTHERN BORDER.—During the month of December the Chief Veterinary Surgeon was summoned to the Crocodile River beyond Victoria on account of uneasiness felt concerning the spread of African Coast Fever in the Northern Transvaal. The Principal Veterinary Officer, Transvaal, Mr. C. E Grey ,and other officials were on the spot and assurances have been given that everything possible has been done to prevent the spread of the disease northwards. Cattle are kept in small troops at native kraals in the Transvaal and several affected herds of these have been promptly destroyed, compensation at the rate of £1 per head being given. At the same time to make assurance doubly sure stock on the northern bank of the Limpopo are all being moved back a considerable distance from the river, which for the next few months at least will itself be impassable. The course of African Coast Fever in the neighbouring States must be a constant and anxious care to Rhodesia and all steps taken to suppress it are heartily welcomed. In the Zoutpansberg district alone since June 4,500 head have been killed off.

ABERDEEN ANGUS CATTLE.— The attention of cattle breeders is drawn to a suggestive paper by Mr. W. H. Williamson, of Salisbury, on the suitability of the Aberdeen Angus breed of cattle to Rhodesian conditions especially for crossing with the native black polls which resemble the "doddies" in many respects. There can be no doubt that as a principle of breeding the combination of like characteristics accentuating such traits is a stronger influence and a more reliable one than the correction of deficiences by crossing with animals showing special development in the direction in which the other parent is wanting. In such cases there is no assurance that the desirable trait will be produced in either the first or subsequent generations; it is just as likely that the bad point will be reproduced. The merits of the Aberdeen Angus breed for crossing with any cattle is also well argued. One drawback may be referred to, the great difficulty of getting South African bred Aberdeens and the consequent necessity of importing from oversea. While it is quite probable that the statement is correct that "from an Aberdeen Angus bull and a black polled native cow, the first progeny both sire and dam, can be relied on to breed true as to type," yet the assertion is made with but little evidence and remains to be proved. As yet we only have first cross calves to judge by. It is stock got by breeding together these first crosses that will show the merits of the superimposition of similar attributes. Such animals would be a form of what has been referred to by Professor Wallace as Rhodesian Aberdeen Angus standard bred cattle although the Professor emphasised the obtaining of such standard animals with crosses on the Africander cow. Much credit is due to Mr. Partridge of Lendy for gathering together a herd of polled native cattle and using a pure bred imported Aberdeen Angus bull amongst them. The views of correspondents on this topic will be welcomed.

SHOWS AND ASSOCIATIONS.— The following are the dates fixed for the Agricultural Shows:—Umtali, 9th and 10th June; Bulawayo, 15th and 16th June; Salisbury, 23rd and 24th June.

We are glad to announce the formation of a new Farmers'

Association, that of Makwiro and Norton, the twentieth in Southern Rhodesia. Mr. Walter Shaw, of Makwiro, is the honorary secretary.

SALE OF TOBACCO.— On the 18th January a most successful sale of Virginian bright leaf tobacco was held at the Warehouse, Salisbury. Buyers came from as far as Cape Town and Port Elizabeth and the bidding was spirited. The leaf had been graded and prepared by Mr. Rice and his assistants, to whom praise is due for the way in which the bales were got up. Mr. Williamson, of Messrs. Whitfield and Co., wielded the hammer and sold 100,000 lbs. weight at an average price of 1/2 per lb. over this large quantity which contained the whole crop of the sellers, not only their selected leaf. The top price 2/4½ was paid by Messrs. Herman and Canard of Cape Town, for some particularly fine bright bales grown by Mr. Deall at Old Umtali, and for the same class 2/2, 2/1 and 2/- was readily paid. These very satisfactory figures speak for themselves and must do much to stimulate the tobacco growers to further effort to produce the class of leaf for which there is so obviously a demand.

Interim Report on the Animal Trypanosomiases of Southern Rhodesia.

By Ll. E. W. Bevan, M.R.C.V.S.

During the latter part of the year 1908, it was announced by Montgomery and Kinghorn that they had found near Broken Hill, a disease of cattle caused by the Trypanosoma dimorphon, in circumstances which led them to the conclusion that the infection might be transmitted from sick to healthy animals by certain flies other than the "tsetse" (Glossina morsitans).

Shortly after this Dr. Theiler stated that he had found the same trypanosome in smears taken from sick cattle in the Hartley District of Southern Rhodesia.

Such important statements rendered it necessary that close attention should be paid to the trypanosomiases of animals in these territories with a view to determining the identity of the causal parasites and the manner of their transmission. Therefore, during the early part of the present year investigations were carried on in the field, and these were followed later by close observations in the newly established Veterinary Bacteriological Laboratory.

WORK IN THE FIELD.

Work in the field was chiefly directed towards the determination of:—

(1) The distribution and prevalence of the disease.

(2) The species of animals naturally affected, and their natural susceptibility or resistance.

(3) The clinical features of the disease.

(4) The transmission of the disease and the distribution and life habits of the blood-sucking flies.

(5) Preventive and curative measures.

Regarding the distribution of the disease it is sufficient to state that it has been closely confined to the Hartley District, parts of the Lomagondi District, and to the Wankie District among animals which were brought there from N.W. Rhodesia. One outbreak was detected on a farm on the Marondellas border of the Charter District, but the disease was confined to animals which had been into the Hartley District. It has since died out.

Careful investigations have always proved a close relationship between the disease and the "tsetse fly:" indeed, up to the present, no case of animal trypanosomiasis has been encountered where it has not been possible to prove previous exposure to the bite of the "fly." Moreover, in the absence of the "tsetse" the disease has failed to spread—in spite of the prevalence of other biting flies, e.g., Stomoxys, Tabanidae, Hippobosca, Haematopota, etc. This will be dealt with more fully later. Where, as at Sipolilos, animals have suffered from the disease in districts free from "tsetse" it has been found that they have been brought there already sick having contracted the infection elsewhere. The history of the animals having passed through a "fly belt" en route, is generally forthcoming. These sick cattle being depastured in areas free from Glossina morsitans, the disease has not been transmitted from them to healthy incontacts. In the vast majority of cases it has died out with them.

Many examples could be cited to prove these contentions. Thus, mobs of cattle coming from Northern Rhodesia have escaped the disease if their drivers have succeeded in avoiding the "fly belts." At the present date four large herds are quarantined at Sipolilos but deaths have only occurred among three of these troops which were exposed to "tsetse" en route. The highest mortality has occurred in one mob which was halted in a "belt" No deaths have occurred in the fourth herd which travelled by a route where no "fly" were encountered. These cattle arrived early in the year, the sick and healthy being herded together ever since, but the deaths have been strictly limited to those animals which were detected by the Cattle Inspector as "fly struck" on his first inspection. There are no "tsetse" at Sipolilos where the animals have been depastured. Apparently no infection has taken place since the animals left the "fly" area.

Some two years ago a large mob of Northern cattle were brought on to Borrowdale, some of these animals being manifestly "fly-struck." Sick and healthy animals were herded together for months until the infected animals were destroyed or died off. In spite of the fact that Stomoxys, Haematopota, Mosquitoes, Ticks, etc., are prevalent on the Estate, the disease has not spread to any of the many hundreds of cattle with which the sick animals freely mixed. On the other hand, a mob of 600 head was brought by Mr. Reynard from Central Africa without becoming infected en route. The history of these animals since their arrival shews that only one small lot, namely a few oxen sent to one of the "fly" infested farms on the railway at Hartley, has contracted the disease. The case of Smethurst's cattle, to which reference will be made in another part of this paper, is a notable example of how the disease fails to spread where "tsetse fly" are absent. So that, in the present state of our knowledge, it would appear that the trypanosomiasis of Southern Rhodesia is strictly related to the distribution of the "tsetse fly" and that if it occurs in an area free from "fly" (G. morsitans) it has been brought there from an infested area and fails to spread.

With regard to the SEASONAL PREVALENCE of the disease, the majority of deaths have occurred between the months of November and April, but a great number of cattle which probably contracted the disease at that time, have lingered on for months, right through the dry season, and have only succumbed with the first showers.

Montgomery and Kinghorn, in discussing the trypanosomiasis due to T. dimorphon, dispute the accuracy of the opinion "that death will occur soon after the commencement of the rains irrespective of the date of infection;" but, in the Hartley District the correctness of the idea was proved in a very remarkable manner during the past month. A single thunder shower was followed by the death of affected animals at Leonard's farm, Gatooma; Dyke's farm; Smethurst's farm at Norton's Siding; and Davidson's cattle at Hartley Station.

A cow at the Laboratory shewed no progressive symptoms of the disease, and, indeed, apeared to be improving in condition, until she was sprayed with cold water; after which

she grew rapidly worse, and was unable to stand until she died a few weeks later. The course of the disease in an experimental calf has been hastened in a similar way.

Montgomery and Kinghorn further maintain that infection takes place between May and October when waggon transport is possible. Last year's experience in the Hartley District shews that infection takes place before and after Christmas. The following particulars have been furnished by farmers who have lost their cattle:—

K. and F. received 16 oxen and one cow and calf on to their farm on February 2nd, 1909, and one ox, four cows and three calves on March 22nd. The first death occurred on April 24th. Fourteen oxen were dead by October and two cows. The deaths were spread over a period of five months. One cow (treated) appears to be recovering.

F. and C. sent 40 trek oxen to the Dreadnought Mine during October and the four following months. Sixteen only of the forty lived until April and these were sold to the natives for meat, being obviously "fly-struck."

S. sent two spans of oxen to Gatooma in March from a clean area. They returned immediately to the non-infected area leaving for another clean district in August. One ox commenced to shew signs of sickness soon after the trip. In September they commenced to die of Trypanosomiasis.

As far as the Hartley District is concerned it is fairly certain that infection has coincided with the prevalence of "tsetse fly," which are most abundant from about November to May. After that, and as the weather becomes colder and windy, the "fly" decreases in number and fresh cases of infection become relatively more rare, another indication of the relation of the disease to the presence of Glossina morsitans.

On the other hand, "tsetse" seem to exist permanently in the district of the Zambesi Escarpment, 25 miles north of Sipolilos, and up in the gullies of the Escarpment, and at any time of the year, cattle passing through these "fly-belts" are liable to contract the disease. The seasonal prevalence of the "tsetse" will be discussed more fully when considering the transmission of the disease.

ANIMALS NATURALLY SUSCEPTIBLE.—The reports of various investigators show that horses, cattle (and espec-

ially calves) are susceptible to natural infection by T. dimorphon. Dutton and Todd found trypnosomes in antelopes, and record several instances of donkeys and horses which having been in the Congo Free State for years (four, five and eight) were in apparently good condition, no trypnosomes being found in their blood. They noted that goats seem to thrive almost everywhere in the Congo, and that sheep, although present in only a few places, usually did well.

Montgomery and Kinghorn mention an impression which obtained that animals born in a "fly" area possessed a degree of immunity not enjoyed by others. They met with one case which tended to bear out this suggestion. They also noted that certain transport donkeys which had been in frequent contact with "tsetse" were apparently free from trypanosomes, but found that one of them was susceptible to artificial infection. They saw films from a donkey containing T. dimorphon. They state that goats were considered immune by Europeans and Natives alike, as were also dogs, but they themselves saw three cases of natural infection in Kaffir dogs.

It is interesting to compare these statements with the observations which have been made in connection with the Hartley trypanosomiasis. To this, cattle are the chief victims, all breeds appearing to be susceptible. A greater number of deaths have occurred among Africander and Colonial-bred cattle and their crosses than among native animals. This may be explained partly by the fact that these heavier animals being more suitable for transport purposes are more often submitted to infection. The Northern, humped cattle are susceptible, and die of the disease (generally the subacute form) but it is thought that they are rather more resistant. Many examples of healthy calves in badly infected herds have been met with; indeed not a single naturally-infected calf has been detected. Laboratory experiments, however, have shown that the calf is susceptible to artificial inoculation.

Horses, mules, and donkeys seem naturally resistant and many examples are forthcoming of these animals having worked continually in "fly" districts without harm. Mr. Begbie has an old grey horse which has been in the Hart-

ley district since 1898. Mr. J. Mack has lost his cattle at the Golden Valley but none of his mules. While the transport oxen working between Gatooma and the Dreadnought Mine have contracted the disease and died in great numbers, donkeys working at the same time and at the same mine, being subjected to practically identical risks, have escaped. Messrs. Clayton's mules have been working in the Gatooma District for the past eighteen months and have frequently been exposed in the most dangerous localities. The argument that these animals travelling at a greater pace than oxen, are submitted to less danger, will not hold good, since they have been out-spanned and allowed to graze in well-known fly areas Nevertheless not a single death or case of sickness has occurred, and, in spite of of hard work they remain in good condition. Similarly not a single mortality from "fly-disease" has occurred among the police horses and mules which have patrolled the district regardless of danger. On the other hand, it has been found that the trypanosome, inoculated into donkeys, mules and horses can live in them.

At the Dreadnought Mine two dogs, fairly well bred, have been exposed without harm throughout the whole of the last "fly" season, although forty trek oxen contracted the disease while working there. Frequently when the cattle came to the mine "tsetse" came with them and were sometimes found afterwards in the windows of the house. The dogs which were generally in or around the dwelling must have been many times exposed to infection. At Hippovale Farm where fourteen oxen have died since February, three dogs, a fox-terrier and two pointers, and two goats, are in excellent condition although they have been in the infected area throughout the whole season. At Fopojena's kraal many cattle have died and the balance have had to be shifted to avoid further risk, but goats and dogs are alive, the former being in excellent condition. The headman stated that "tsetse" bit goats and sheep but did not make them sick. He also volunteered the information that if young dogs, still suckling, were bitten by the "fly" they did not die but were subsequently able to live in the "fly area."

It is hard to reconcile the apparent resistance of goats and sheep, as well as of equines, with laboratory results,

since it has been found that the trypanosome makes its appearance from time to time in donkeys, mules and horses, into which it has been artificially inoculated, and a strain of the parasite having been established in sheep it has increased with extraordinary rapidity in virulence by passage from one sheep to another.

Evidently some very important difference exists between artificial inoculation and natural infection.

SYMPTOMS :—The following clinical picture of cattle suffering from trypanosomiasis in North Western Rhodesia is given by Montgomery and Kinghorn :—At some period there is the appearance of emaciation and dullness, the coat harsh and hide bound, head drooping, eyes dull and watery, but petechiae on the conjunctival membranes were rarely noted, and occasionally there is a nasal discharge." This description applies equally to the Hartley trypanosomiasis bnt several other symptoms are described which would lead one to suppose that the two diseases may not be identical. Attention will be drawn to these differences. Most of the Hartley cases seen since May have been cases of the chronic or sub-acute form of the disease, the animals acutely affected dying earlier. CattleInspectors and others who saw these acute cases record that they frequently met with temperatures as high as 106 degrees F. and mortality among cattle in good condition. On the other hand, chronic and lingering cases seldom show an elevated temperature and not infrequently a sub-normal one, even in the extreme heat of the day. The sick cattle which have survived the wet season and have reached the cold dry months of July and August when grazing is scarce, are not only reduced to a skeleton by the disease but are also handicapped by the poverty of pasture. It is sometimes extremely difficult to determine whether specific disease or hard work and lack of food is responsible for the poor condition of the animal.

It may be that a certain number of infected animals die of an acute form of the disease and in the febrile stages (as often occurs in Surra), but the more typical cases (the so-called "fly struck" animals), have a hard dry coat, the hair standing on end and appearing very coarse and dusty. In places the skin falls off in flakes. The animal is hide-bound, "tucked up" and shows no inclination to lick itself.

Tears run from the eyes and sometimes strings of mucus from the nose and saliva from the mouth. The prescapular and precrural glands may or may not be enlarged. In some undoubted cases of the disease they were not larger than normal. In this country these glands are so frequently enlarged from causes other than trypanosomiasis that they are of little or no diagnostic value. The animal is seen at its worst early in the morning after the cold of the night, when it is often too weak to rise. In nearly all far advanced cases there has been noticed great weakness of the hind quarters, the animal swaying and dragging its legs; it is often too weak to lift its feet to avoid a stone. The muscles of the hind quarters waste away, the anus is retracted and the sphincter seems to lose its power so that faeces accumulate in the hollow beneath the tail. Chronic diarrhoea is frequently met with together with the loss of power to regulate the discharge of the faeces, the animals hind quarters becoming foul and scalded. These features are in contra-distinction to Montgomery's experience, since he writes "weakness and paresis of the hind limbs is not common." In Hartley cases they are almost always present and are practically diagnostic. The animal feeds greedily: even in those cases where it is unable to stand up it will lie feeding the whole time, even up to a few hours before death. The mucous membranes are anaemic and the heart weak, fluttering and extremely fast.

Recently an outbreak has been investigated where the oxen were thin but had none of the above symptoms; their coats were fairly glossy, there was no noticeable swelling of the glands. A few had a little running from the eyes and some were scalded slightly between the legs. The diagnosis from clinical symptoms was "low condition from overwork and poor pastures," but microscopic examination of blood from some of the worst revealed trypanosomes.

With regard to the trypanosomiasis investigated by them, Montgomery and Kinghorn state that "there is no close relationship between the temperature and the number of parasites seen; sometimes 104 or 105 degrees was unaccompanied by trypanosomes, or only one to twenty fields, and again, a temperature of 101 degrees has been seen with organisms four to a field. Two cases were observed in which organisms were not seen for two or three weeks."

In another place they state that "parasites could be usually found on direct examination of the peripheral blood."

Experience in this country seems to indicate that there is little if any relation between the presence of parasites in the peripheral blood or glands and the temperature or clinical condition of the animal It has sometimes happened that parasites have been found in an animal whose appearance would not lead one to suppose that it was suffering from the disease, or in chronic cases with normal temperatures: while none could be found in animals obviously affected and with elevated temperatures. This feature is of some practical importance in this country were so much depends upon microscopic diagnosis of disease.

The recent experience in connection with the chronic cases at Sipolilos is worthy of note. Early in June blood smears were made by Cattle Inspector Morris from a great many cattle clinically "fly-struck," and trypanosomes were found in a great many of them. In October he again inspected these animals and took blood from about fourteen of the worst. A careful examination of these smears failed to reveal a single parasite in any of them. Inoculation of blood from four of them into rabbits proved negative. Large quantities (5 c.c.) of warm blood from the jugular vein direct were injected subcutaneously into the rabbits, so the result can hardly be attributed to error of technique.

When at Hartley in October blood smears were taken from a sick cow and heifer belonging to Mr. Davidson. These contained an unusual number of parasites. About four weeks after the Cattle Inspector at Hartley was asked to collect further blood-smears, as it was intended, if the parasites were still present, to use blood from these animals to establish a new laboratory strain. The results of examination were quite unexpected,—no trypanosomes could be detected.

In this connection the daily thermal and microscopic examination record of the experimental calf at this laboratory is of interest.

THE PERIOD OF INCUBATION in natural cases is hard to estimate for the reason that the acute cases die unex-

pectedly, and, in chronic or sub-acute cases the blood is not examined until the disease is well advanced. Unfortunately no case is forthcoming where the date of infection and earliest appearance of the parasite in the blood can be defined.

The following details give some rough idea as to the average duration of the disease.

A settler D. brought 19 head on to a hitherto unoccupied farm during October and December 1908. All appeared in good condition. First death February, 1909, two more followed in a fortnight, four more occurred within six weeks, five lingered three months, three still alive having apparently recovered, the balance appear to have escaped infection.

L. brought 25 head from the S. E. end of his farm in April (no deaths had occurred and the cattle were apparently in good health) to the N. W. end of the farm which is crossed by the main road. First death June 2nd, second death three weeks after, one more death the following week. Fourteen deaths before November.

F .and K. brought 16 oxen one cow and one calf, from a clean farm to their farm (hitherto unoccupied) February 2nd 1909. First death, an ox, April 24th. Also one ox, four cows and three calves from Hartley on March 22nd. The cows had been on Hartley Commonage in apparent health for years. Of the total herd 16 are now dead (November) and one cow appears to be recovering. The four calves are all alive and in good health.

F .and C. sent 40 trek oxen, in good condition, to work at the D. Mine in October. The first death occurred in December. All but 16 died within two or three months. The sixteen, all believed to be infected, were slaughtered.

S had 30 trek oxen working at Gadzema where no deaths have occurred. In March he took them one trip into the infected area, and returned at once. One animal commenced to lose condition soon after. In August they were removed to a farm still further from infection. In September this ox died and five others before the middle of November. Trypanosomes have been found in the blood of some of the remainder.

Concerning the trypanosomiiasis of North Western Rhodesia, Montgomery and Kinghorn wrote that "it seems possible that in a few cattle a chronic form is established," but in this country it would appear that quite a large proportion of cattle survive the acute stage and take on a sub-acute or chronic form of the disease.

Indeed, one may divide the various outbreaks into three categories:—

1. In which the cattle have died rapidly and of the acute form of the disease; as at theDreadnought, Golden Valley.

2. In which cattle have died of the sub-acute or chronic form of the disease: as at Sipolilos, Eiffel Blue Mine, and Smethurst's Farm.

3. A combination of 1 and 2, as at Bosberry Farm, Hippovale Farm ,and Sabonabon Farm.

In seeking for an explanation one is struck by the fact that those of the first class lived in a "fly" area and were constantly submitted to infection. Those of the second class passed once or twice only through a "belt;" while those of the third class lived on the edge of a "fly zone" and were occasionally submitted to infection. Such an explanation seems to be borne out by laboratory experiments in which it has been found that an animal suffering from a sub-acute form of the disease after a single injection of virulent material, will develop the acute form if inoculated repeatedly.

POST MORTEM lesions met with in sub-acute and chronic cases are those of anaemia and cachexia. The muscles are pale and flabby and the fat is gelatinous and does not set. There is generally a quantity of fluid in the thoracic, pericardial and peritoneal cavities. The blood and bone marrow are unusually watery.

Enlargement of the spleen and lymphatic glands has not been remarked, except in one small rabbit, in which the spleen weighed 15 grammes.

TRANSMISSION. Montgomery and Kinghorn, in their "Report on Trypanosomiasis of Domestic Stock in North Western Rhodesia, 1908," came to the following conclusions:—

(1) That trypanosomiasis of domestic stock is very prevalent in the northern area of North-Western Rhodesia, and

that it is due to Trypanosoma dimorphon of the Gambia, Trypanosoma vivax of the Cameroons, and one morphologically allied to Trypanosoma brucei of South Africa.

(2) That the trypanosomes may be transmitted by Glossina morsitans, Stomoxys calcitrans and a specimen of Lyperosia. In nature it will depend upon the conditions under which cattle are maintained to which of these genera special attention must be paid in prophylaxis.

Earlier in their report they seem to support the suspicion of a native cattle owner that Tabanidae may play a similar role.

In May last the Veterinary Department of this country submitted to Dr. Theiler, Bacteriologist of the Transvaal Government, certain smears from sick cattle in Hartley and from Sesheke, N.W.R. In these he stated, at the time, that he had found Trypanosoma dimorphon. From the October number of the Transvaal Agricultural Journal, it would appear that he has since modified his early diagnosis for he now writes concerning these smears "we found a trypanosome which we had to identify with the type dimorphon. We are, however, not yet in a position to identify it with any species."

Trypanosomiasis is by no means a new disease in the Hartley district; it was known in the "early days" that domestic stock became "fly-struck" there, but the disease seemed to receive a check when rinderpest decimated the cattle and game in the country. It is certain that since 1905 animals have been dying from the disease and outbreaks have been investigated from time to time by officers of the Veterinary Department. The recent taking up and stocking of farms in the "fly belts" and the increased mining activity in the district, has been followed by an unusual number of deaths among stock.

While therefore it is incorrect to term the disease in the Hartley district "a new outbreak," the recent statement by Montgomery and Theiler give it a new and wider importance, for if the causal organism can be transmitted by blood-sucking flies other than the "tsetse" the disease must sooner or later spread from its present well-defined area—the "tsetse fly" area—to other parts of the country free

from the Glossina but infested by the other incriminated flies.

Several observers have found the T. dimorphon in the blood of antelopes; it is therefore probable that game would constitute a "reservoir of infection" as much beyond legislative control as the suspected transmitters—the blood sucking flies.

While therefore, in the present state of our knowledge, precautionary measures are necessary, it is reassuring to consider the circumstance upon which Montgomery based his theory. The instances which to his mind proved conclusively that the common stable or stinging house-fly, (Stomoxys calsitrans) can transmit Trypanosoma dimorphon if this is introduced into their haunts, are the following:—

(1) An outbreak on a farm near Broken Hill where Stomoxys and Lyperosia were incriminated because "tsetse" could not be found. It is however admitted that Glossinae were met with 2½ miles from the farm, and that six bullocks having been sent on a journey, returned to the farm passing through a "fly belt" about eight miles from the farm.

(2) An outbreak on a farmnear Chinsali, where "tsetse" were again not found, but "Glossinae were frequently seen three miles away."

(3) An outbreak recorded by Lane, N.E. Rhodesia, occurring on a farm 25 miles from Fort Jamieson, among stock the property of a Mr. B. and the Administration. It has recently been officially stated that the origin of, and dealings in these cattle, are difficult to trace.

In connection with this outbreak it is interesting to note that on May 9th, 1909, between thirty and forty animals had died but that since the end of June no further deaths have occurred.

(4) An outbreak on the edge of the Government Farm (also recorded by Lane). The first deaths occurring in February and the disease died out in May. Lane placed two healthy animals among the infected but they "never shewed any signs of suffering from the disease."

Lane subsequently payed visits to the scene of this outbreak with a view to determining whether "tsetse" were present but had to admit that he "could come to no satisfactory conclusion."

(5) The diagnosis of T. dimorphon in three districts of Portuguese East Africa where it is somewhat hastily claimed "tsetse are absolutely unknown."

According to Dr. Theiler there is some doubt as to whether the trypanosome of Portuguese East Africa is T. dimorphon or may be considered "as a species of its own." Further, on the question as to the presence of the "tsetse fly" in the places where the outbreaks occurred (Chai-Chai) he writes: "A thorough investigation into the question of the presence or absence of the tsetse flies is therefore necessary. Before this is done we cannot accept the conclusion that other flies than tsetse carried this trypanosome."

While investigating the trypanosomiases of Southern Rhodesia, evidence has been sought which would have a bearing upon Montgomery's hypothesis. However, up to the present, not a single case has been encountered where it has not been possible to prove exposure, at some time or another, to the bite of the "tsetse fly."

Several cases have been advanced claiming to prove the opposite, but careful investigations have always demonstrated the fallacy of the argument.

In obscure cases, one or more of the following circumstances have helped to hide the association between the disease and the "fly":—

(1) The fact that it does not require a great number of flies to set up an infection.

Montgomery records that he exposed two healthy bullocks to the bite of G. morsitans by driving them over a road through a "fly" area. Two flies were seen to settle on one animal and only one on the second, nevertheless T. dimorphon was detected in the blood of both animals in less than a month from the date of exposure.

(2) The death of cattle may not occur until many months after infection. This has been discussed already when considering the natural period of incubation.

(3) The seasonal prevalence of "fly." During the dry season, with its cold and windy weather, "tsetse" are few and difficult to find, even in the districts where, during the hot weather, they are extremely plentiful. Even as early as the end of May and beginning of June they have begun to disappear.

In the Hartley District, during the dry season the "tsetse" can only be found in the neighbourhood of certain pools and rivulets, which, when the rains come filling the vleis and head-waters, join up to form a continuous water-course. It is held by natives and white men who have lived in the district that the "tsetse" then extend from their permanent haunts and make their way along the stream. In popular parlence, the "'fly' comes down"—an expression which obtained in the early Delagoa days. As the water-ways dry up, the "fly" once more retreats to the neighbourhood where it has its permanent haunts. The activity of the "fly" is also held to be associated with the movements of game, buffalo and zebra being thought to be chiefly responsible. Game, however, cannot be the only factor in the distribution of "tsetse" for if so it might be expected to extend from the Hartley to the neighbouring districts in which, at present, "tsetse" are never met with.

If the factor which limits the "tsetse" to the southern side of the Umfuli River so strictly that four hundred head of cattle are working unharmed round the Giant Mine, not three miles from the Hippovale Farm (on the other bank of the river) where eighteen cattle out of twenty-six contracted the disease, could be determined, an advance would have been made in the solution of the problem.

An example of the periodical appearance of the "tsetse" was met with at certain farms on the head-waters of the Suri-Suri River. Here flies were seen during the rains but could not be found during the dry season (after June). By following up the water-course they were found in their permanent haunts, at some pools some six miles away. This temporary invasion of the fly, however, was followed by disastrous results.

It is therefore extremely difficult in the dry season to state whether a locality is or is not "in the fly."

(4) The danger of cattle entering a "fly area" unknown. Where native herd-boys are relied upon, this is a risk which must not be overlooked when seeking the source of an outbreak.

(5) The travelling of "fly" with cattle, men or game. Many examples are forthcoming of "tsetse" having travelled some distance from their permanent haunts with transport oxen, on horses, on the backs of men, or even in railway carriages. It is not unreasonable to suppose that such "fly," having left their usual haunts and finding themselves unable to return, may perform a certain amount of damage before they die out.

The estimates of the distance "tsetse" may thus travel vary. Mr. Meikle quotes an example when, finding "fly" on his cattle at night, he pushed on through "clean country" until the morning. He then discovered them still on his oxen a distance of 23 miles from the place at which they must have been picked up.

(6) Unreliable evidence often misleads the investigator who has not experience of the informant: he must rely only upon those statements which he is able to confirm.

On the other hand a considerable quantity of evidence is available, which, while pointing to the intimate relation between the "tsetse fly" and the disease at Hartley and Sipolilos, appears to exonerate other blood-sucking flies.

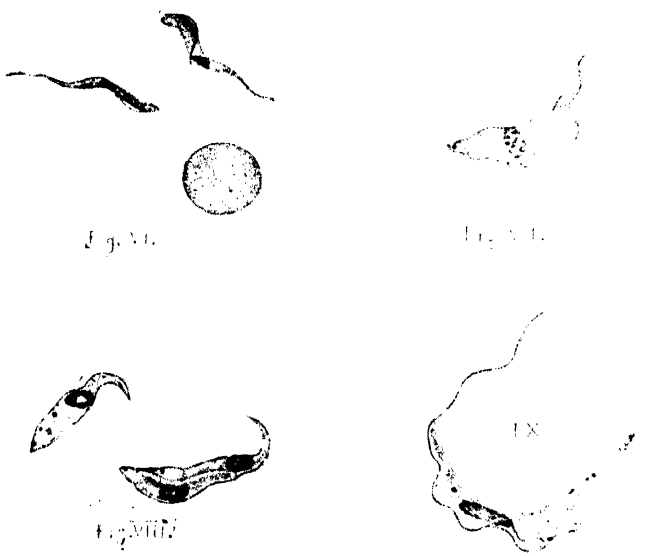
(1) In the earlier part of this report mention was made of the remarkably strict localisation of the disease to "fly areas," and that when infected animals had been introduced to "tsetse-free" districts the disease has not spread to in-contacts, in spite of the presence of blood-sucking flies. Reference was made to the Sipolilos cattle, Borrowdale, Reynard's, and Smethurst's animals.

Other examples may be given. Thus, B. & Co. brought four infected animals from Gatooma to an area where no Glossinae exist. One animal died on the way but the three others, badly affected, were herded with 200 animals from other non-infected parts of Southern Rhodesia. The three gradually pined away and died three months after arrival. Stomoxys, Hippobosca rufipes, and other blood-sucking flies were taken where these animals were depastured. The in-contacts have been carefully watched, but as far as can be proved by blood examination and sub-inoculations, none have contracted the disease.



Trypanosoma dimorphon.

(Or Pecaudi). Reproduced from the Third Report of the Wellcome Research Laboratories.



Trypanosoma dimorphon.

Reproduced from Dutton & Todd's First Report. Fig. VI. represents the "tadpole-shaped" parasite; No. VII. the "stumpy"; and No. IX. the "long" form.

(2) The outbreak on the farm "Hippovale" is a remarkable example of the strict localisation of the disease. On this farm eighteen animals became infected out of twenty-six and drank daily at the Umfuli River and grazed along its southern bank. On the other side of the river is the Giant Mine, less than three miles distant. About four hundred oxen are working at and around the mine, and many must have been close enough to the sick animals for blood-sucking flies to have passed from one to the other. This was quite possible in the case of the mine Scotch-cart oxen, which daily came to the river for sand. While a heavy mortality occurred among the farm cattle, the mine cattle entirely escaped infection. Tabanidae and other blood sucking flies were present on the river in such great numbers that in my early report I recommended the place as especially suitable for entomological research.

It has been remarked by several observers (Anderson, Livingstone, Peel) that "tsetse" may abound on one side of a stream while there may be none on the other. The present instance seems to be an example, for the Umfuli River constitutes a very clearly defined limit to the Hartley "fly area" and "disease area" alike.

(3) Recently, at a farmers' meeting at Hartley, twenty men, all vitally interested in the question, unanimously supported the contention of one who read a paper on the subject, that in the hot rainy season, cattle in the district were pestered by swarms of biting flies which attacked them so viciously that blood poured from them. Seeing that these flies passed freely from sick to healthy, he considered that even mechanical transmission of the trypanosome by them must be unusual, for if it were otherwise, none of the animals in proximity to a sick beast could escape infection, whereas fully 50 per cent. have done so, except where the animals have been submitted to the bite of the "tsetse."

The recent discovery by Kleine, since confirmed by Bruce, in connection with the part played by G. palpalis in the transmission of T. gambiense and also of a trypanosome of dimorphic type, the flies becoming infective after sixteen, nineteen and twenty days, "seems to suggest that the parasite undergoes a cycle of development in the Glossina which is probably, for this parasite, a true definite host."

On the other hand, we have in "surra" a trypanosomiasis which is not spread by the "tsetse" but which is known

to be transmitted by other blood-sucking flies.

In a series of experiments regarding the natural transmission of "surra" carried out by Leese at Mohand in 1908, certain interesting results were obtained. He found that the biting flies met with during the "surra" season were Tabanus (eighteen varieties) Stomoxys, Hippobosca, Haematobia Lyperosia, sand-flies, and Chrysops; also mosquitos of the genera Anopheles, Culex, Stegomyia, and possibly others. Of these he found that Chrysops, Hæmatobia and Lyperosia were too scarce to play any important part in the transmission of "surra" in Mohand.

He could obtain no evidence by experiment in support of mosquitos or Stomyxs as "surra-transmitters" depending upon a cycle of development, but a good deal against it. As mechanical transmitters, he obtained positive results with local species of Tabanus, Haematopota and Stomoxys calcitrans.

Negative results attended experiments with Anopheles, Stegomyia and Sand-flies.

After careful observation and experiment he considered it well established that Tabanus is the most dangerous surra-transmitting fly; and that Haematopota is also dangerous. He believed that Stomyxs is involved to a considerable degree.

In one experiment, of six ponies kept in contact with surra in a surra-zone and in the surra season, the only two which did not become affected were those protected from biting flies.

Now many of the biting flies enumerated are to be met with in Southern Rhodesia; Tabanus and Haematopota being extremely prevalent and widely distributed at certain times of the year. The former are already present in great numbers at the end of November (they were first seen in October) and are by no means confined to "tsetse" areas; they are equally prevalent in districts where no cases of trypanosomiasis have been known to occur except those brought in from "tsetse" districts.

If, therefore, the trypanosomiases of Southern Rhodesia can be transmitted by the same agents as "surra," it might have been expected that where the "reservoirs of infection" have been introduced into districts where the transmitters are plentiful (as has frequently happened) the disease would have made its appearance among the cattle with which the

sick have been daily herded. In view of the ready notification of animal diseases which obtains in this country, examples should have come to official notice; it is somewhat significant that, up to the present, not a single occurrence of this description has been put on record.

LABORATORY INVESTIGATIONS.

In the endeavour to identify the trypanosomes of Southern Rhodesia it became necessary to collect the very scattered literature and divergent opinions concerning Trypanosoma dimorphon, since Montgomery and Kinghorn claimed to have found that parasite in the northern territories of the colony, and Theiler, in his early diagnoses, considered the trypanosome of the Hartley district to be the same.

The difficulties in connection with this parasite began with its earliest discoveries by Dutton and Todd. These investigators when engaged in the Trypanosomiasis Expedition of the Liverpool School of Tropical Medicine, 1902, discovered in the blood of horses a pathogenic trypanosome which they described under the style of "the Gambian Horse Trypanosome"; but as the result of their own observations and official enquiries they came to the conclusion that cattle and domestic animals did not suffer from this trypanosomiasis. They failed to detect the trypanosome in the blood of many domestic animals, goats, cattle, donkeys and sheep examined by them.

They recognised three forms of parasite, namely:—

(1) A long slender form.
(2) A short "tadpole" form.
(3) A "stumpy" form.

Recently, in working with the strain of the parasite brought to Europe by Dutton and Todd, various observers have failed to see the long forms with thin body and a free flagellum as described by them and have given to the parasite the name of "T. dimorphon."

The difficulties which arose at the beginning have increased, and as recently as September, 1909, we find Montgomery and Kinghorn striving to explain and correct the various discrepancies which have grown with the increased study of the organism. To rectify the difference between Dutton and Todd's Gambian strain and that studied in Europe, they propose to call the latter strain "T. confusum."

Many observers claim to have met with T. dimorphon in various parts of the world, as will be seen by the following table :—

TRYPANOSOMIA DIMORPHON.

DISCOVERER.	PLACE.	ANIMAL AFFECTED.
Dutton and Todd (1902)	Bahan and Cape St. Mary	In 5 out of 6 horses examined.
	Bathurst	In 3 out of 7 horses.
	Maka (150 miles inland	In two horses out of eight.
		Not found in goats, sheep, cattle, and donkeys.
Dutton, Todd and Kinghorn (1907)	Congo Free State	In cattle of nearly every herd examined.
Kerankel	French Congo	Horses and cattle.
Major Smith (1904)	Sierra Lione	Ox.
Martin (1905)	Lower Guinea Banks of the Niger	Horse, ass, ox, sheep, goat, pig, dog.
Bruce, Nabarro and Greig	Uganda	In cattle brought from Bukedi to Jinga. Pathogenic for dog, rat, rabbit, sheep, ox, goat, guineapig.
Old	Nyasaland	Cattle.
Bouet	Upper Ivory Coast	Sheep, goats, dogs.
Pecaud	Lower Dahomey	52 out of 4,300 small domestic animals examined
Dutton and Todd	Along Congo from Leopoldville to Kasongo	Antelope and cattle.
Balfour	White Nile, Sebat in Bahr-el-Ghazal	Mules, horses and donkeys (T. pecaudi?).
Edington	Zanzibar	Horse.
Montg'm'ry & Kinghorn	N.W. Rhodesia	Domestic amimals.
Theiler	S. Rhodesia	Cattle. (T. dimorphon?)
Connacher	Portuguese East Africa	" " "
Lane	N.E. Rhodesia	"

Since the discovery of the Trypanosoma dimorphon, quite a number of very similar trypanosomes, pathogenic to the lower animals, have been described. Most of these, while agreeing in the main with T. dimorphon, have differed in some small feature of morphology, motility, pathogenic effect produced, or in the relative susceptibility of animals to them.

Bruce has lately complained that "the classification of the pathogenic trypanosomes is in a state of chaos," but justifies the endeavour to classify the various species encountered in South Africa on the grounds that "if there is some well-marked difference in two trypanosomes, even if alike in shape, such as their power of setting up disease in certain animals, their mode of spreading from sick to healty—it may be in one by tsetse flies, in another by stomoxys, or tabanus, or by some other means—then, naturally, it is of great practical use to distinguish them by different specific names." "For example, when we have to do with Trypanosoma gambiense, we at once know that man is susceptible, that the carrier is Glossina palpalis, and we must keep ourselves out of the area of distribution of this fly if we would escape infection. If it is Trypanosoma brucei, then we know man is not susceptible, but we must keep our horses, cattle and dogs out of the area of distribution." On this basis it is desirable to establish the identity of the trypanosome which is injuriously affecting domestic stock in this country.

Reference may be made here to Dr. Theiler's article in the October number of the "Transvaal Agricultural Journal" (1909), in which he explains the differences between the trypanosome met with in Mozambique and T. dimorphon and T congolense, the two known trypanosomes which it most resembled. The fact that in his first official reports he identified the Hartley parasite as Trypanosoma dimorphon, but now qualifies his diagnosis by stating that the organism is of dimorphic type, would indicate an element of uncertainty as to the identity of the Hartley species. Other experts have experienced a similar difficulty. Early in July, blood-smears were taken from a rabbit which had been inoculated from an infected ox at Gatooma. This animal had died unexpectedly on the seventeenth day after inoculation and was not seen immediately, but some smears were taken before putrefaction had become too advanced.

Specimens were sent to various authorities. McFadyean failed to stain any of the preparations well with Giemsa, and could not get the membrane or flagellum well shewn. He therefore found it difficult to offer an opinion as to the species of trypanosome present, but wrote, "as far as I can judge they do not correspond with the T. dimorphon."

Mesnil also hesitated to express an opinion on coloured preparations, but, to him, the trypanosome appeared to be Trypanosoma dimorphon—sensu stricto.

Specimens from the same rabbit together with other smears from "fly-struck" cattle were sent to the Director of the Sleeping Sickness Bureau of the Royal Society, who found in one of the Sipolilos slides that Trypanosomes were numerous and "certainly suggestive of T. dimorphon." In all he could clearly see there was no free flagellum.

These preparations were also sent to Minchin, who thought the parasite "very unlike Brucei."

While these authorities were handicapped by the difficulties attending diagnosis from stained preparations and found it impossible to express a definite conclusion, it would appear that the trypanosome in the preparations sent to them was of "dimorphic" rather than "brucei" type.

Montgomery, in his paper read before the Rhodesian Scientific Association, said: "As is well known, Trypanosoma Gambiense of man is travelling in a Southerly direction into Rhodesia, which was previously uninfected. The question that arises is, is T. dimorphon following a similar course? This is very difficult to answer, for "fly disease" is a term covering a multitude of sins, and only in a relatively small number of cases have trypanosomes been diagnosed microscopically, and these have usually been ascribed to that well-known name, Trypanosoma brucei. Indeed, it would be easy to one unused to trypanosome investigations and not having facilities for experimental observations to overlook the differences between the two parasites. But we have this evidence, that previous to 1907, Trypanosoma dimorphon had not been seen."

While Montgomery is probably correct in his suggestion that previous to this discovery, all animal trypanosomes in Rhodesia had been attributed to T. brucei; there is reason to suppose that a parasite in many respects resembling T. dimorphon, without free flagellum, and with ill-defined and

little festooned undulating membrane, has been present in Southern Rhodesian stock for some years. The parasite is probably the same as that which at the present time is causing mortality amongst cattle in the Lomagondi and Hartley districts. Hitherto it has been regarded as a degeneration or involution form of T. brucei, an opinion which recent diagnoses by experts shew to be incorrect.

Among the numerous smears sent to me for diagnosis during the past five years many have contained trypanosomes Unfortunately, in my absence a collection of these smears has been mislaid or destroyed, otherwise the identity of the organism seen so often might have been determined. One preparation taken from a Police mule, which had become "fly struck" on a boundary patrol about 1905-6 along the N.E. border, was found. This smear contained a trypanosome identical morphologically with the parasite met with recently in sick cattle in the Hartley district. The preparation was sent to the Director of the Sleeping Sickness Bureau, who in turn sent it to Breinl, who expressed his opinion that the specimen "did not seem to be brucei."

Whether the present trypanosomiasis is of recent introduction or has existed in Southern Rhodesia for some years, and whether it is caused by T. dimorphon or T. brucei, of both, or is due to an entirely distinct species, are questions which remain to be solved.

THE PARASITE.

In cases of natural infection (cattle) parasites have been very scarce, even when the blood or gland smears have been made from dead animals or those known by their clinical manifestations to be severely affected. In several such cases a coverglass preparation has contained only one or two specimens, and frequently careful search has revealed none at all.

The same thing has been observed in animals under observation at the laboratory, as may be seen from the charts.

The blood of one cow under observation at the Institute for several weeks, which came from a severely infected area, together with cattle which have since died of trypanosomiasis, has been regularly examined but always with negative results, although this cow may be regarded as a typically "fly-struck" animal.

The temperature chart and trypanosome record of the calf No. 13, are of interest in that they would indicate that the elevation of temperature and appearance of parasites in the peripheral circulation have little, if any, relation to one another. The same applies in the case of the two experimental sheep No. 15 and No. 20.

In the case of rabbits No. 1 and No. 12 the parasites were met with for short periods and then disappeared. With the first onset of parasites the animals lost condition and appeared sick, but during the period when trypanosomes could not be detected they improved in health and even became fat. As it was thought they had become immune or tolerant, the re-appearance of parasites came as a surprise.

These circumstances are of some practical importance since outbreaks of disease suspected to be trypanosomiasis will have to be diagnosed by the history and clinical symptoms as much as by microscopic examination of the blood.

This experience corresponds with that of Dutton, Todd, and Kinghorn, who, in connection with the cattle trypanosomiasis (due to T. dimorphon) in the Congo Free State, found that in some cases "every means may fail to show the parasite in infected animals." Montgomery and Kinghorn also record similar experiences, although in another part of their report they state "parasites could usually be found on direct examination of the peripheral blood."

With regard to the trypanosome records of the laboratory animals appended, it is to be regretted that, until September, observations could not be made regularly and the charts are therefore very incomplete. Lately more continuous attention has been given to laboratory work and a system of blood examination and trypanosome count been established which make the records more regular and exact.

MORPHOLOGY.

In blood-smears from sick cattle in the Hartley and Lomagondi districts, the trypanosome met with has been a straight, stiffly-curved, or S-shaped organism, measuring from 15 to 30 m. in length and 1.5 m. to 3 m. in width. Forms about 18 m. to 20 m have predominated. In appearance it most closely resembles the "long" and "intermediate"

forms of T. dimorphon figured in Laveran and Mesnil's book on Trypanosomes and Trypanosomiases—page 345 (reproduced herewith).

Forms resembling a tadpole have not been encountered in naturally infected animals, but the term "tadpole" is unsatisfactory. It may be presumed that forms resembling Fig. 6 Plate I, Dutton and Todd's First Report of their expedition to Senegambia, are referred to by Montgomery when he states that "tadpole" forms of T. dimorphon "precominated in all animals, except during the last few days of life in a few cases," and that "'tadpole' forms were found in every animal with the exception of one moribund case."

The interpretation of the term is of some importance as forms resembling the above illustration, although not infrequently seen, have certainly not predominated in either natural cases or artificially inoculated animals in this country.

The appearance of the trypanosome differs greatly with the method of staining employed. Leishman's stain does not stain the protoplasm very deeply. The portion posterior to the nucleus takes the stain more faintly than the portion anterior to it. Giemsa's stain colours it a puce tint, and is more successful in bringing out the flagellum. This is best seen when the stain is used warm and the preparation is slightly over-coloured. It is but little festooned, there being seldom more than one or two folds.

A free flagellum (sensu stricto) has not been seen, but the protoplasm anterior to the nucleus tapers off gradually to the extremity of the membrane.

Chromatic granules have not been seen in natural cases and vacuoles only where the parasite was undergoing disintegration.

The centrosome is situated laterally a little distance from the posterior extremity, which is blunt or conical; "pike" forms have not been noted.

The nucleus is irregular; Laveran's stain brings it out clearly and gives it an oval shape. The red-colouring matter appears fragmented. By other methods it appears an oval, elongated in the direction of the body and occupying the whole width of the parasite.

In a blood-smear from a sick animal at Sipolilos which had recently come from N. E. Rhodesia, a single giant trypanosome recalling T. Theileri was seen. This is the first occasion on which a trypanosome of this type has been encountered in this country.

IN SUB-INOCULATIONS.

A laboratory strain of the parasite having now been established the trypanosome has been studied in the blood of rabbits, guineapigs, rats, sheep, donkeys, a mule and a horse.

RABBITS.—The first animal to re-act was a rabbit inoculated from an ox at Gatooma. This died rather suddenly on the 17th day, and the blood was only examined when post-mortem changes had already set in. Nevertheless parasites averaging 2.5 to the field were seen; whereas in two other rabbits which died, although parasites were plentiful the day preceeding death, none could be found a few hours after, either in the blood or sections of the various organs.

In this first rabbit, parasites of a great variety of forms, far more numerous than in natural cases, presented themselves. An average taken from a large number of counts was found to be 2.5 to a field. The blood having started to decompose the parasites met with may be regarded as degeneration forms.

Briefly, parasites from 12 m. to 30 m. in length, and from 1.2 to 3.5 m. in width were seen. Trypanosomes about 15 m. long predominated. The most remarkable features were the bluntly conical or rounded posterior extremity; sharply defined micro-nucleus laterally placed, having a clear space unstained by Leishman anterior to it which often contained granules; absence of or failure to stain an undulating membrane with flagellum; oval or round nucleus anterior to centre; absence of free flagellum; no agglutination. Fission forms common.

In the rabbit from which the laboratory strain was established inoculated from an ox on July 22nd, parasites were seen on September 15th. Trypanosomes were not numerous, approximately 1 in a dozen fields. Chiefly intermediate forms were seen, *i.e.*, about 20 m. long and 2.5 m. wide. A few as short as 12 m. and others measuring 30 m. were present. Over-stained by Giemsa and subsequently

sufficiently discolourised, the following features were distinguished :—

Posterior extremity conical or square-cut; micro nucleus lateral and frequently elongated; undulating membrane generally showing two folds, one in front of and one behind the nucleus. Body-protoplasm extending along the flagellum to the anterior extremity; nucleus oval or elongated, apparently occupying the whole width of the body.

In a smear taken from Rabbit No. 1 on the 31st day after inoculation, the various forms of parasites met with were grouped into four classes according to their length :—

Class A. measuring up to 14 m.	Class B. measuring from 14-16 m.	Class C. measuring 16-18 m.	Class D. measuring 18 m. and over

In twelve counts 25 parasites were seen and were classified as follows :—

Class A	...	...	5
Class B	...	...	5
Class C	...	...	8
Class D	...	...	7
			25

Montgomery in describing the T. dimorphon of N.W. Rhodesia, writes :—"In rabbits, in a film made from a single case, only 'tadpole' forms were seen."

SHEEP.—In a smear taken from a sheep the day before death, trypanosomes were found about six to the field. Forms about 15 m. to 18 m. in length and 2 m. in width predominated.

These forms resembled closely the so-called "stumpy" forms pictured in Fig. 7, Plate No. 1, of Dutton and Todd's first report. (Reproduced.)

The nucleus was generally oval, elongated in the direction of the parasite. In a few exceptional cases there appeared to be a small free portion of the flagellum not more than 3 m. long; in the majority, the protoplasm could be distinctly traced to the extremity of the flagellum. Some long forms about 25 m. in length and 2.5 m. to 3 m. at the widest part,

i.e., across the nucleus, and some equally long slender forms were seen.

In these latter it was difficult to decide whether any part of the flagellum extended beyond the limit of the body-protoplasm.

No forms shorter than 13 m. in length were noted. In smears taken at earlier stages of the disease the same forms, and some a little narrower, were seen, but it may be said that at no time did Montgomery's description of T. dimorphon apply, namely, "in sheep and goats only the tadpole forms were seen. These measured from 9.75 m. to 14.5 m. in length, and from 1 m. to 1.75 m. in width." The various forms were classified as in the preceding section with the following results :—

In a smear showing 51 parasites in 10 fields :—

Class A	...	8
Class B	...	34
Class C	...	8
Class D	...	1
		51

RATS.—In a smear taken the second day after the appearance of trypanosomes in the blood, medium forms predominated. The following is a measurement of a common type :—

From posterior extremity to micro-nucleus ...	2 m.
From micronucleus to posterior margin of nucleus	4 m.
Length of nucleus	4 m.
From anterior margin of nucleus to anterior extremity	8 m.
Total ...	18 m.

Average width :—

Level with micronucleus	2 m.
Level with nucleus	2.5 m.
Level with posterior margin of nucleus ...	2 m.

Gradually tapering off to anterior extremity.

Chromatic granules were seen in the portion of the protoplasm anterior to the nucleus.

When stained by Giemsa an undulating membrane and flagellum could be seen, but no free portion of the flagellum was observed.

In a smear taken from a rat just after death, a few broader forms were seen, but the narrow forms from 15 m. to 20 m. in length still predominated.

In the case of T. dimorphon in the rat, Montgomery found that "'tadpole' forms predominated throughout the first few days of the disease, while the 'stumpy' became more numerous towards death. 'Long' forms were very rare, but were seen it those inoculated from an ox, a goat, and a guinea-pig."

The rats at this laboratory were inoculated from a rabbit and a sheep.

In a preparation used for classification, the parasites averaged 3.2 to the field, and in ten fields were classed as follows:—

Class A	...	2
Class B	...	10
Class C	...	10
Class D	...	10
		32

GUINEA-PIGS have been inoculated with blood from rabbits. The smears for description were taken from two animals on the 8th and 11th days respectively.

In the first very few organisms were present, namely, 1 in 5¾ fields; but in the second an average of 9.4 to the field was taken.

In the first, all the organisms seen belonged to Class B as defined in the paragraph relating to rabbits; in the second the 94 parasites seen in the field were counted as follows:—

Class A	...	24
Closs B	...	68
Class C	...	2
Total	...	94

All the organisms met with were narrow, an undulating membrane with flagellum was only rarely seen. Broad forms were absent.

As far as the specimens examined in this laboratory are concerned the parasite in the guinea-pig shews the greatest uniformity of type.

HORSES, MULES AND DONKEYS.—In view of the popular opinion that equines are resistant to the Hartley Trypanosomiasis, the results of artificial inoculations with laboratory strain have been of interest. In each of these animals, at varying times after inoculation, trypanosomes have been detected in the blood; but, as will be seen from the charts, they have never been present in great numbers and have shewn a tendency to disappear rather than to increase.

They have been of the same type as those described in guineapigs.

It is interesting to note that in Dutton and Todd's original cases of horse trypanosomiasis in Senegambia, they found a distinct relation between the number of parasites in a horse's blood and the rise in temperature. In horse No. 1 the number of parasites in the blood three days before death was 2,900 per cubic mm. In other cases parasites were never very numerous, only a few being seen to a cover-slip and these appeared periodically.

MOTILITY.—The Hartley trypanosome examined in the blood of sub-inoculated animals seems to wriggle violently "sur place" never travelling far beyond a small area of the microscopic field. Becoming adherent or attached to a red corpuscle its free end is lashed violently, the corpuscle sometimes being turned completely over by the vigorous struggles of the parasite. Leaving one cell the trypanosome may pass to another near at hand, but the area of movement is limited and its passage easy to follow. No darting movement across or out of the field takes place.

AGGLUTINATION.—Several observers have noted a tendency on the part of T. dimorphon to agglutinate, when blood containing many trypanosomes from rats or mice (also some say from rabbits or guineapigs) is placed on a slide and covered with a cover-glass. This has not been noticed in connection with the Hartley trypanosome, but it must be remarked that it is only seldom that the parasites have been seen in sufficient quantities for a process such as agglutination to be detected.

EXPERIMENTAL INFECTION BY T. DIMORPHON.

Investigator		Incubation Days.	Duration Days.	Remarks.
		HORSES.		
D. & T. (Gambia)		?	?	Alive 2½ years
		DONKEYS.		
M. & K.		78	?	3 T.'s to field
		CATTLE.		
D. & T. Gambia		9	20	Calf
		12	40	Ox
M. & K.		8	87	Treated with Atoxyl
		GOATS.		
D. & T.		3-5	?	Alive after 1 year
L. & M.		6	12½-21½	
M. & K.		7-12	...	Tertian and quartan febrile reactions
		SHEEP.		
D. & T. Gambia		8	...	
T. & B.		16	84	
M. & K.		7-8	...	Temperature as with goats
		DOGS.		
D. & T. Gambia		8	29	
L. & M.		10	25	
T. & B.	adult	4-8	10-19 adult	10-26 puppies
D. & T. Congo		12	?	
M. & K.	adult	16	30	
	young	7-11	17-21	
		MONKEYS.		
D. & T. Gambia		4	...	Two never infected
„ Congo	cattle	...	...	
„	horse	6	...	Macacus
L. & M.		...	160	Cercopithecus
T. & B.		...	75	Macacus rhesus
		CATS.		
T. & B.	adult	12-14	chronic	Tryp. irregular
	kitten	7½	23	
		RABBITS.		
D. & T. Gambia		13	53	
T. & B.		4-15	26-35 acute	78-157 chronic
L. & M.		12	76 and 115	
D. & T. Congo	cattle	21 (usual)	...	Tends to become chronic
„ „	horse	14 „	173-178	
M. & K.		10	168	
		GUINEA-PIGS.		
D. & T. Gambia		4-8	29-31	T.'s numerous at death
T. & B.		4-15	9-60	
D. & T. Congo	cattle	...	Up to 139	
„ „	horse	6 weeks	90	
M. & K.		12½ days	24	

EXPERIMENTAL INFECTION BY T. DIMORPHON.—*Continued.*

Investigator		Incubation Days.	Duration Days.	Remarks.
		WHITE RATS.		
D. & T. Gambia		8	31	T. always present
L. & M.		...	10-42	T. numerous
T. & B.		4-7	7-42	
D. & T. Congo	cattle	5-14	80	Periodicity of T.
„ „	horse	4-6	70	
M. & K.		6-10	18-29	T.constantly present
		MICE.		
D. & T. Gambia		5	16	
L. & M.		...	Acute or chronic	Always fatal
D. & T. Congo	cattle	4	Chronic	
„ „	horse	2	As long as 5 mos.	

NOTE.—D. & T. signifies Dutton & Todd; L. & M., Laveran & Mesnil; T. & B., Thomas & Breinl; M. & K., Montgomery & Kinghorn.

ARTIFICIAL INOCULATION.

(a) FIELD STRAIN.

(Animals inoculated from naturally infected animals).

RABBITS.—Eight rabbits inoculated from naturally infected animals have failed to become infected, but it must be admitted that the blood used, although it contained trypanosomes, came from cattle suffering from the chronic or sub-acute rather than the acute form of the disease. In two instances positive results have been obtained:—

(1) Rabbit inoculated from Fitt's ox, Gatooma. Died unexpectedly on the 17th day. Blood shewed degeneration forms, average 2.5 to the field.

(2) White rabbit, inoculated July 22nd from ox, Bosbury Farm, Hartley. Died September 17th. Severely infected. Absence from laboratory prevented daily observation. Death accelerated by bleeding. Laboratory strain established from this animal.

GUINEA-PIGS. — Half-a-dozen inoculated from natural cases have not become infected.

RATS.—Five inoculated from field cases have not contracted the disease.

LABORATORY STRAIN.

PASSAGE NO. 1.—Taken from a sick ox, Bosbury Farm, July 22nd. Inoculated into white rabbit which died September 17th.

PASSAGE NO. 2.—Blood of white rabbit inoculated September 17th into :—

No. 1 Rabbit (white with grey ears)
„ 2 Rabbit (Belgian hare)
„ 3 Guinea-pig
„ 4 „
„ 5 „
„ 6 „
„ 7 Rat
„ 8 „
„ 14 Mule
„ 15 Sheep

PASSAGE NO. 3.—Blood of No. 1 inoculated October 1st into :—

No. 11 Rabbit (black)
„ 12 „ (black and white)
„ 13 Calf

Also on October 13th into :—

No. 16 Guineapig (white, long-haired)
„ 17 „ („ smooth-haired)

PASSAGE NO. 4.—Blood from No. 11 inoculated October 15th into :—

No. 18 Rabbit
, 19 Mule (also No. 14).

PASSAGE NO. 3a.—Blood from No. 7 inoculated 3rd October into :—

No. 9 Donkey (large)
„ 10 Donkey (small)

No. 9 also received blood from No. 15 and 13 on Nov. 18th.

PASSAGE (mixed virus).—Virus mixed from Passage 3 and 4.—Blood from No. 15 and 13 inoculated on November 18th into :—

No. 9 Donkey
„ 10 Donkey
„ 14 Mule

PASSAGE NO. 3b.—Blood from No. 15 inoculated Novem-

ber 21st into:—

No. 20 Sheep (brown)

Also November 18th into:—

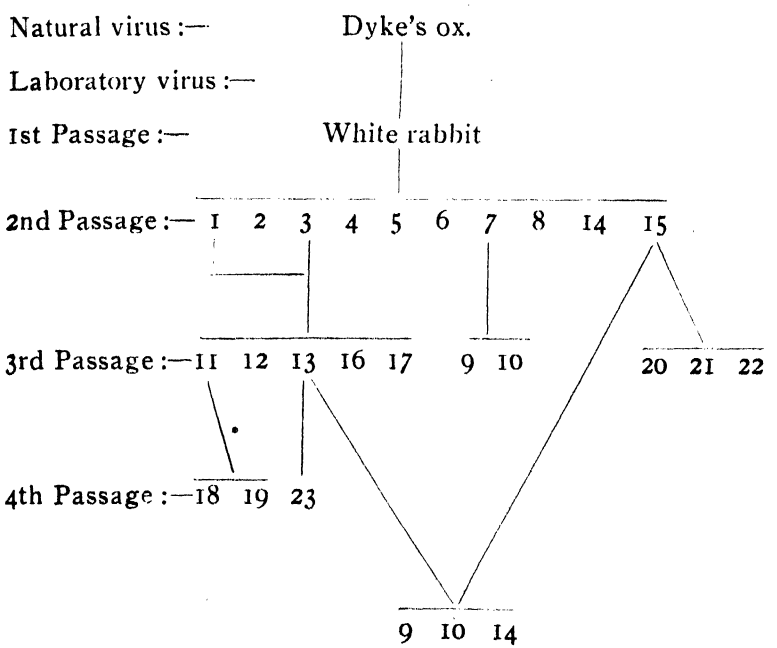
No. 21 Rat

„ 22 Rat

PASSAGE NO. 4a.—Blood from No. 13 inoculated November 6th into:—

No. 23 Horse

TABLE OF INOCULATIONS AND PASSAGES.



No. 1 White rabbit with grey ears.
„ 2 Belgian hare.
„ 3 Guinea pig.
„ 4 „
„ 5 „
„ 6 „
„ 7 Rat.
„ 8 „
„ 9 Donkey.
„ 10 „
„ 11 Black and white rabbit.
„ 12 Black rabbit.
„ 13 Calf.

No. 14 Mule.
„ 15 Sheep.
„ 16 Guinea pig.
„ 17 „
„ 18 Rabbit.
„ 19 Mule.
„ 20 Sheep.
„ 21 Rat.
„ 22 „
„ 23 Horse.

RABBITS.

RABBIT NO. 1.—(Refer table of strains)—
Inoculated September 17th, 1909
Trypanosomes first seen September 28th
Period of incubation, 11 days

History :—

September 17—Inoculated
„ 28—Trypanosomes first seen
„ 29— „ average, 1 in 3 fields
„ 30—A few
October 1— „
„ 3— „
„ 4— „
„ 5— „
„ 11— „
„ 12—One seen
„ 13— „
„ 19—None seen
„ 26—A few
November 1—None seen
„ 2— „
„ 15—A few
December 6—Average 5½ trypanosomes to field
„ 7— „ 2 „ „
„ 8— „ 1 „ „
„ 9— „ 2 „ „
„ 10—Died. No trypanosomes could be found in blood or sections of or organs. P.M. made 12 hours after death.

Remarks. — Negative searches not generally recorded. During the periods when trypanosomes were absent the animal improved in condition and even became fat.

RABBIT NO. 11.—
Virus from No. 1.
Inoculated October 1st, 1909.
Trypanosomes first seen October 12th, 1909.
Period of incubation, 11 days.
History:—

October 1—Inoculated
" 12—Two trypanosomes to a field
" 15—Died after bleeding.

RABBIT NO. 12.—
Virus from No. 1
Inoculated October 1st
Trypanosomes first seen October 11th
Period of incubation, 10 days
History:—

October 1—Inoculated
" 11—Trypanosomes, 1 in 12 fields
" 12— "
" 14— "
" 15— "
" 20— " plentiful
" 26— " "
November 1— " few
" 2— " one seen
" 6— " several
" 15— " "
" 20— " one seen
" 24— " none seen
" 27—Much improved in condition
" 28—Trypanosomes, 1 in 25 fields
" 30— " " 32 "
December 6— " " 27 "
" 8— " " 25 "
" 9— " " 25 "
" 11— " " 18 "
" 14— " " 14 "

RABBIT NO. 18.—
Virus from No. 11.
Inoculated October 15th, 1909.
Trypanosomes first seen October 26th, 1909.
Period of incubation 11 days.

History :—

October 15—Inoculated
„ 26—Trypanosomes seen
„ 29—Negative
November 2— „
„ 6— „
„ 15— „
„ 21—Died during the night

Remarks.—To serve as a control to Mule No. 14-19. Although trypanosomes were at one time present, death cannot be attributed to trypanosomiasis.

GUINEA-PIGS.

GUINEA-PIG NO. 3.—

Virus from original white rabbit.
Inoculated September 17th, 1909.
Trypanosomes first seen October 11th.
Period of incubation 24 days.

History :—

September 17—Inoculated
October 11—Three trypanosomes to a field
„ 12—Five to a field
„ 15—Died

GUINEA-PIGS NO. 4, 5, 6.—

Inoculated under same conditions as above.
Trypanosomes never seen

GUINEA-PIG NO. 16.—

Virus from No. 1
Inoculated October 13th, 1909
Trypanosomes first seen October 29th
Period of incubation 16 days

History :—

October 13—Inoculated
„ 29—Trypanosomes first seen—two only
November 1—Negative
„ 2— „
„ 6— „
„ 7—Died from abdominal abscess.

GUINEA-PIG NO. 17.—

Virus from No. 1
Inoculated October 13th
Trypanosomes first seen October 26th
Period of incubation 13 days

History :—

October 13—Inoculated
„ 26—One trypanosome seen
„ 29—Two seen
November 1—One seen
„ 2—Several seen
„ 6—Seven in one field, average
„ 7—Plentiful
„ 10—Died after overdose of drug

RATS.

RAT NO. 7.—
Virus from original white rabbit
Inoculated September 17th, 1909
Trypanosomes first seen October 1st
Period of incubation 14 days

History :—

September 17—Inoculated
October 1—Trypanosomes seen. Not plentiful
„ 3—Died from an accident. Blood and tissue emulsion used for inoculation of Nos. 9 and 10.

RAT NO. 8.—
Virus as for No. 7.
Inoculated under same conditions as No. 7
Trypanosomes never seen.

RAT NO. 21.—
Virus from Sheep No. 15.
Inoculated November 18th.
Trypanosomes first seen December 9th
Period of incubation 21 days

History ;—

November 18—Inoculated
December 9— 2 trypanosomes to the field
„ 10— 4½ „ „ „
„ 11— 7 „ „ „
„ 12— 4 „ „ „
„ 14—12 „ „ „
„ 15— 9 „ „ „

RAT No. 22.—
Inoculated as No. 21
Never reacted

SHEEP.

SHEEP NO. 15.—

(a) Virus from Bernstein's ox
Inoculated July, 1909

(b) Virus from No. 1, tissue emulsion
Inoculated September 17th, 1909

(c) Virus from No. 13 (calf) 10 c c warm blood
Inoculated November 6th, 1909
Trypanosomes first seen November 17th

Remarks.—This animal maintained its condition until a few day previous to the appearance of parasites in the blood, after which it rapidly grew sick and died rather unexpectedly. The principal symptoms were rapid loss of flesh, hollows flanks, "pot-belly," dull appearance of the head, excessive micturition, very rapid pulse with regurgitations. Lachrymation not observed. During the last day the animal had difficulty in breathing and was unable to stand.

Date.	Temperature.	Trypanosome Record.
September 17	101.4	Inoculated second time
„ 18	100	
„ 19	101.2	
„ 20	100.6	
„ 21	...	
„ 22	103	
„ 23	100	
„ 24	101.5	
„ 25	103.2	
„ 26	102.8	
„ 27	102.5	
„ 28	103.2	
„ 29	103.9	
„ 30	...	
October 1	...	
„ 2	...	
„ 3	101.5	
„ 4	100.2	
„ 5	103	

Date	Temperature	Trypanosome Record
October 6	103.2	
,, 7	102.6	
,, 8	103.2	
,, 9	...	
,, 10	101.8	
,, 11	101.8	
,, 12	101.8	
,, 13	101.8	
,, 14	103	
,, 15	101.8	
,, 16	102.8	
,, 17	...	
,, 18	101.8	
,, 19	102	
,, 20	103	
,, 21	103.2	
,, 22	102.6	
,, 23	102.4	
,, 24	101.4	
,, 25	102	
,, 26	102.5	
,, 27	102.6	
,, 28	103.2	
,, 29	101	
,, 30	101.6	
,, 31	101.6	
November 1	...	
,, 2	102.6	
,, 3	102.6	
,, 4	102.6	
,, 5	...	
,, 6	102.6	Third inoculation
,, 7	103	
,, 8	102.6	
,, 9	103	
,, 10	104	
,, 11	104	
,, 12	104.5	
,, 13	103.5	
,, 14	103.5	
,, 15	105.4	
,, 16	103	
,, 17	102	A few trypanosomes
,, 18	104	Several
,, 19	106.2	
,, 20	103.4	
,, 21	100.7	Died

SHEEP NO. 20.—

Virus Emulsion from tissues of No. 15.
Inoculated November 21st.
Trypanosomes first seen December 4th.
Period of incubation, 13 days.

Date.	Temperature	Trypanosome Record
November 21	101	
„ 22	101	
„ 23	101	
„ 24	101.6	
„ 25	101.6	
„ 26	101.4	
„ 27	102	
„ 28	103	
„ 29	100.8	
„ 30	100.8	
December 1	103.2	
„ 2	101.8	
„ 3	102.4	
„ 4	103.8	Average, 1 in 8 fields
„ 5	103	„ 1 „ 10½ „
„ 6	104.2	„ 1 „ 7 „
„ 7	102	„ 1 „ 5½ „
„ 8	103.4	„ 1 „ 2 „
„ 9	104.4	„ 1 „ 17 „
„ 10	103.8	„ 1 „ 11 „
„ 11	103	„ 1 „ 9 „
„ 12	101	Negative
„ 13	104.6	„
„ 14	105	„
„ 15	104.4	
„ 16	105	
„ 17	105	Average, 1 in 10 fields
		Died

Remarks.—Post mortem examination shewed old-standing septic pneumonia and pleurisy with adhesions. The spleen was enlarged and pultaceous. Death, probably due to trypanosomiasis, may have been hastened by these lesions.

SHEEP NO. 24.—

Virus 5 c c warm citrated blood from Sheep 20
Inoculated December 11th, 1909
Trypanosomes first seen December 17th, 1909
Period of incubation 6 days

Date.	Temperature.	Trypanosome Record.
December 10	100	
,, 11	100	Inoculated
,, 12	101.5	
,, 13	100	
,, 14	100	
,, 15	100'6	
,, 16	103.6	
,, 17	102	Average, 1 in 57 fields
,, 18	102.6	,, 2 ,, 1 field
,, 19	102.6	,, 6 ,, 1 field
,, 20	...	
,, 21	103.8	Found dead

SHEEP NO. 25.—

Virus as in case 24
Inoculation ditto
Trypanosomes first seen December 19th, 1909
Period of incubation 8 days

Date.	Temperature.	Trypanosome Record.
December 10	100.6	
,, 11	100	Inoculated
,, 12	101	
,, 13	100	
,, 14	100	
,, 15	104	
,, 16	103.4	
,, 17	102.4	Negative
,, 18	102.4	
,, 19	103.5	Average, 7 in 10 fields
,, 20	102.4	,, 1½ in 1 field
,, 21	103.2	,, 5 in 1 field

Remarks.—It would appear from the above that the virus has become exalted by passage through sheep. Whereas sheep No. 15 was comparatively resistant to more than one inoculation, the period of incubation in sheep No. 20 was 13 days, in No. 25 eight days and in 24 only six days. In the last two the disease ran a very rapid course.

CATTLE.

CALF NO. 13.—

Virus: Three c c citrated blood from No. 1
Inoculated October 1st, 1909
Trypanosome first seen October 18th, 1909
Period of incubation 17 days

Date	Temperature	Trypanosome Record
October 1	101.6	Inoculated
,, 2	101.6	
,, 3	101.6	
,, 4	101.9	
,, 6	102.6	
,, 6	102.6	
,, 7	102.6	
,, 8	102.6	
,, 9	103.5	
,, 10	105.5	
,, 11	104.6	
,, 12	105.6	
,, 13	102.8	
,, 14	102.8	
,, 15	103.6	
,, 16	...	
,, 17	...	
,, 18	105	Trypanosomes first seen
,, 19	102.8	
,, 20	103.4	
,, 21	105	Average 1 in 50 fields
,, 22	102.8	
,, 23	101.4	
,, 24	103.8	
,, 25	104	Negative
,, 26	101.8	Trypanosomes seen
,, 27	105	Average, 1 in 4 fields
,, 28	103	
,, 29	102.4	Negative
,, 30	103	
,, 31	104	
November 1	102.4	
,, 2	104	
,, 3	105	
,, 4	104	
,, 5	102.5	
,, 6	104	A few
,, 7	103	
,, 8	102	
,, 9	103	

Date	Temperature	Trypanosome Record
November 10	104.6	
„ 11	102.5	Negative
„ 12	103	
„ 13	104.2	
„ 14	...	
„ 15	102.4	Negative
„ 16	106.4	Trypanosomes seen
„ 17	103.5	do.
„ 18	102.6	Negative
„ 19	102.4	
„ 20	102.2	Negative
„ 21	104	
„ 22	103	
„ 23	102.5	
„ 24	102	1 trypanosome seen
„ 25	102	
„ 26	102	Average, 1 in 4 fields
„ 27	104.8	Negative
„ 28	101.6	do.
„ 29	100	do.
„ 30	102.6	
December 1	105.4	Average, 1 in 7½ fields
„ 2	103.8	Average, 1 in 9 fields
„ 3	100.2	Negative
„ 4	101.4	do.
„ 5	...	do.
„ 6	105.4	do.
„ 7	101.2	do.
„ 8	101	do.
„ 9	104.4	do.
„ 10	101.5	do.
„ 11	100.5	do.
„ 12	102	do.
„ 13	102.4	do.
„ 14	102.4	do.
„ 15	101.8	do.
„ 16	103.5	do.
„ 17	103	do.
„ 18	101.5	do.
„ 19	101.5	do.
„ 20	103.5	do.

Still under observation.

MULE NO. 14.

Inoculation No. 1:—

Virus: Tissue emulsion from white rabbit

Inoculated Septer ber 17th

Inoculation No. 2 :—

Virus: Warm blood from No. 2

Inoculated October 15th

Trypanosomes first seen October 25th

Period of incubation, 38 days from first injection; 10 days from second injection

Inoculation No. 3 :—

Virus: Mixed bloods from Nos. 13 and 15

Inoculated November 18th

Remarks.—The mule was received in very poor condition. Its thyroid glands were enlarged, each being the size of a duck's egg. The animal remained weak and emaciated throughout the experiments. Had it been readily susceptible it should have proved an easy victim to trypanosomiasis. The viruses used were very strong, but the trypanosome, although it appeared from time to time, was never found in great numbers, and finally disappeared from the peripheral circulation.

Date.	Temperature.	Trypanosome Record.
September 17	99.8	Inoculated
„ 18	98.8	
„ 19	98.3	
„ 20	99.2	
„ 21	...	
„ 22	98.4	
„ 23	99.5	
„ 24	99.2	
„ 25	99.2	
„ 26	...	
„ 27	98	
„ 28	99	
„ 29	99.4	
„ 30	99.5	
October 1	99.5	
„ 2	99.5	
„ 3	99.5	
„ 4	99.5	
„ 5	99.5	
„ 6	98.2	
„ 7	99	
„ 8	99	
„ 9	99.2	
„ 10	100	

Date.	Temperature.	Trypanosome Record.
October 11	100	
„ 12	99.6	
„ 13	99.6	
„ 14	100	
„ 15	100	Inoculated
„ 16	100.4	
„ 17	100.7	
„ 18	101	
„ 19	101	
„ 20	100	
„ 21	...	
„ 22	99.2	
„ 23	...	
„ 24	100.6	
„ 25	100	Average, 1 in 20 fields
„ 26	99.8	3 trypanosomes seen
„ 27	100	
„ 28	100	
„ 29	...	Negative
„ 30	98.8	
„ 31	98.5	
November 1	...	
„ 2	99.7	Negative
„ 3	...	
„ 4	...	
„ 5	...	
„ 6	99.7	
„ 7	100.2	
„ 8	100.2	
„ 9	100	
„ 10	...	
„ 11	100	Negative
„ 12	99	
„ 13	98	
„ 14	97.2	
„ 15	...	
„ 16	97.6	
„ 17	97.3	
„ 18	97.4	
„ 19	97.2	
„ 20	97.5	
„ 21	98.8	
„ 22	102.5	
„ 23	102	
„ 24	101.6	
„ 25	101.3	Average, 2 in 50 fields
„ 26	98.7	„ 1 in 16 „
„ 27	98.7	
„ 28	98.3	

Date.	Temperature.	Trypanosome Record.
November 29	98.4	
,, 30	98.5	
December 1	99.1	,, 1 in 26 ,,
,, 2	99.5	
,, 3	98.8	
,, 4	98.3	
,, 5	100.3	
,, 6	99.8	
,, 7	99	
,, 8	100.3	Negative
,, 9	99	
,, 10	97.5	
,, 11	97	Negative
,, 12	97	
,, 13	98.5	
,, 14	99	Negative
,, 15	97	
,, 16	98	
,, 17	99	

HORSE NO. 23.—

Virus, 10 c c of warm blood containing trypanosomes from Calf No. 13, injected subcutaneously

Inoculated November 6th

Trypanosomes first seen December 3rd

Period of incubation 27 days

Remarks.—The horse (a gelding) is an aged but healthy subject. On the day on which parasites were seen in the blood the animal showed oedema of the sheath and swelling of the legs. Small nodular swellings could be felt under the skin of the hind legs. Round blotches of a light colour measuring one to five inches in diameter appeared on the skin and have persisted. The animal has not fallen off in condition, and appears in the best of health. The oedema has subsided.

Date.	Temperature.	Trypanosome Record.
November 6	100	
,, 7	100.5	
,, 8	99.8	
,, 9	100	
,, 10	100	
,, 11	99.8	
,, 12	100	
,, 13	...	
,, 14	99.7	
,, 15	99.8	
,, 16	99.5	
,, 17	99.3	
,, 18	99.3	
,, 19	98.8	
,, 20	99.2	
,, 21	99.2	
,, 22	100	
,, 23	99.6	
,, 24	99.8	
,, 25	100	
,, 26	99.5	
,, 27	99.5	
,, 28	99.3	
,, 29	99.3	
,, 30	100	
December 1	100.2	
,, 2	99.2	
,, 3	98.4	Trypanosomes first seen
,, 4	99.2	Negative
,, 5	100	,,
,, 6	102.2	,,
,, 7	99	,,
,, 8	99.2	,,
,, 9	99	,,
,, 10	99.8	,,
,, 11	99.8	,,
,, 12	99.8	,,
,, 13	100	,,
,, 14	99.8	,,
,, 15	100.2	,,
,, 16	99	,,
,, 17	99.8	,,



Trypanosoma dimorphon.

After Leveran and Mesnil. The figures closely resemble the Hartley trypanosome.



Trypanosoma dimorphon.

After Bruce, Hamerton & Bateman. The forms shewn resemble some of the smaller types of Hartley trypanosome.

DONKEYS.

DONKEY NO. 9.—

(a) Virus 5 c.c. tissue emulsion of Rat No. 7.
Inoculated 3rd October, 1909.

(b) Virus 5 c.c. warm blood from calf and sheep Nos. 13 and 15.
Inoculated November 18th, 1909.
Trypanosomes first seen November 23rd.
Period of incubation, 51 days if infected from first inoculation—5 days if infected from second inoculation.

History :—

November 23—A few trypanosomes seen
„ 24—Three „ „
„ 25—Average, one in 64 fields
„ 26— „ one in 30 „
„ 28— „ one in 14 „
December 1— „ one in 67 „
„ 9— „ None in 50 „
„ 14—Negative

Remarks.—This animal was extremely weak and emaciated when handed over for experimental purposes, and has remained so. It has been frequently exposed to heavy rains. Temperature was frequently below normal. In the circumstances, if the trypanosome were pathogenic to donkeys it should have found very little natural resistance in this animal and death should have resulted more rapidly than in the case of a healthy subject. Nevertheless the parasite does not appear to increase in numbers, although it does not entirely disappear. As to whether the first or second virus was responsible for the infection, the fact that Donkey No. 10 shewed parasites 53 days after the first injection of the same virus, having received no second virus, would indicate that the first inoculation was responsible.

DONKEY NO. 10.—

Virus 5 c.c. tissue emulsion of Rat No. 7.
Inoculated October 3rd, 1909.
Trypanosomes first seen November 25th.
Period of incubation, 53 days.

History :—

November 25—One parasite seen
December 3—Destroyed

Remarks.—This animal was handed over for experimental purposes on account of its extreme weakness and emaciation. On December 3rd it was too weak to rise on its legs and was therefore destroyed. The weakness was probably due to other causes than trypanosomiasis.

THE IDENTITY OF THE HARTLEY TRYPANSOME.

"Trypanosoma Dimorphon."—Considerable difficulty has been experienced in the endeavour to identify the Hartley trypanosome. As has been mentioned before, Theiler in his earliest reports stated that he found the Trypanosoma dimorphon in smears from Hartley sick cattle but subsequently modified his early diagnosis by classing the parasite as one of "dimorphic type."

By the term Trypanosoma dimorphon one understands the parasite first described by Dutton and Todd and met with by them in horses in Gambia. A very high percentage of horses in that colony were infected, a circumstance which does not correspond with our experience with equines in the Hartley district.

The same observers afterwards found the same parasite in other domestic animals and in antelopes in the Congo, and according to Montgomery and Kinghorn it was the same organism which they encountered in cattle in North Western Rhodesia.

Throughout this report the endeavour has been made to compare the trypanosome of Southern Rhodesia with that described and investigated by these latter authorities and it will be seen that, while the two organisms and the diseases produced by them correspond very closely, there are many minor points of difference, which, taken collectively, would suggest that the two parasites may not be identical.

It is especially in the morphology of the trypanosomes in laboratory animals, the clinical symptoms in cattle and sheep, and in the relative resistance of the smaller experi-

mental animals, that the Hartley trypanosomiasis differs from that of stock in North Western Rhodesia.

The literature on the subject of T. dimorphon is so scattered and the opinions of experts so divergent, that it becomes almost impossible for the isolated worker to determine whether he has to deal with the parasite itself, an allied organism, a mixed infection or an entirely different species.

To add to the confusion, Mesnil has recently expressed his opinion, in a letter addressed to the Director of the Sleeping Sickness Bureau, that the original Trypanosoma dimorphon, described by Dutton and Tood, includes Trypanosoma dimorphon (sensu Laveran and Mesnil), Trypanosoma cazalboui (Laveran) and Trypanosoma pecaudi (Laveran). These species can be found at the same time in one animal.

Montgomery tries to clear up the difference between the observations of European investigators and himself and his predecessors by giving a new name to the European type, namely, Typanosoma confusum

The next difficulty lies in the endeavour to determine whether the Hartley trypanosome is the same as that recently investigated by Theiler in rabbits inoculated from sick cattle at Chai-Chai, and in a horse exposed to the bite of flies in Tsetse country in Zululand, which, in his opinion, resembled the "Trypanosoma dimorphon or more particularly Trypanosoma congolense." His parasite was found to differ from "Congolense in that it proved not to be pathogenic for every rabbit which was inoculated in the first place, and not at all for guinea-pigs." Theiler "injected three guinea-pigs with each strain and kept them for various periods under observation, and in no instance could the examination of their blood prove the presence of trypanosomes."

"The blood of these animals was also inoculated into dogs, sheep, and white rats which, however, never developed the trypanosome, thus proving that it was absent in the guinea-pigs."

Theiler comes to the conclusion that "the trypanosome of Chai-Chai and Zululand has for this purpose to be considered as a species of its own."

It will be seen that positive results have been obtained in guinea-pigs inoculated with a laboratory strain of the Hartley trypanosome, and that long forms of the parasite have frequently been met with in various animals. Possibly therefore, Theiler's new species is not the same as that met with in Southern Rhodesia.

The presence of long forms also differentiates the Hartley parasite from T. congolense" a trypanosome which has been described as "a variety of T. dimorphon in which the long forms have disappeared."

Standard specimens of "Trypanosoma pecaudi," obtained from the Pasteur Institute, Paris, have been compared with specimens from Hartley and shew well-marked differences, especially as regards the folds of the undulating membrane and the absence of forms with a long and distinct free-flagellum.

The fact that "T. cazalboui" is not infective when inoculated into rodents (rats, mice, guinea pigs) would suggest that it is not the trypanosome we are dealing with. Moreover, T. cazalboui is very motile, another feature of difference.

"Trypanosoma nanum," a trypanosome which appears "to be of extensive distribution, being found on the Sobat, in the Bahr-El-Ghazal Province,and also in Uganda" (Wenyon) although bearing many features of resemblance to the Hartley organism, both as regards morphology and the clinical symptoms it gives rise to, differs in the reactions it produces in laboratory animals. Both rats and rabbits appear to be refractory.

The forms pictured on page 137 "Wellcome Research Laboratories Report" very closely resemble the Hartley trypanosome but one drawing shews a free-flagellum of far greater development than that met with in the Hartley type. Of the many illustrations shewn in the above Report figures 10 and 14 of Plate X.,shew the closest resemblance to the trypanosome of this country.

TREATMENT.

Treatment has not been attempted on a large scale but the results attending a few initial trials in the field have been highly satisfactory. The cases treated have been suffering from the sub-acute form of the disease but the parasite has been detected in the blood of each.

With one exception the treated animals have lived and have improved in condition while other untreated animals in the herd have grown progressively worse and have died .The animals to be treated have always been selected by the fact that they appeared more severely ill than the others.

Experimental work with drugs in the laboratory has been seriously handicapped by the fact that parasites are so sparingly present in the blood as to render observations on the effects of drugs upon them impossible. Moreover their presence in the blood is so irregular and varies for other reasons than medical treatment, that natural phenomena might easily have been attributed to the exhibition of drugs, etc.

These objections have been partly removed now that a strain of the parasite has been established in sheep characterised by a fairly constant invasion of the blood by trypanosomes and a regular train of symptoms. Further, the results of the administration of drugs has recently been determined by the effects upon the temperature rather than the appearance and disappearance of parasites—a system which allows an estimate to be made of the result of the treatment in cattle as well as sheep.

This branch of the work has therefore just commenced but the foregoing laboratory observations have placed it upon a scientific and workable basis.

Aberdeen Angus Cattle.

By W. H. WILLIAMSON.

The Christmas Exhibitions of Cattle in Britain and America for the year 1909 have again brought into prominence the particular excellence of the Aberdeen Angus breed for beef production. Those who are now engaged in introducing the breed into Rhodesia will feel satisfied that their aims and endeavours are worthy and that the results sought for are substantial and real. Reporting on the last Smithfield Show the "Banffshire Journal" states:—"Search as one may the history of the Smithfield Club, long and honourable as it is, we question whether at any show there will be found in the case of any other breed of cattle such a notable record as that which has to-day been established by the Aberdeen Angus race of cattle. Never before at any show of the Smithfield Club has a breed and its crosses swept the board so completely as did the Aberdeen Angus to-day within the Agricultural Hall at Islington, for there was scarcely an honour open to them which they and their crosses did not carry off with flying colours. The Aberdeen Angus breed now hold the notable position of having within recent years won more championship honours here than all the other breeds of cattle put together."

The same journal continues:—"The great testing centre is the London Smithfield show at which provision is made for all breeds and varieties of cattle reared in Great Britain. To win at Smithfield is the greatest feat in British Fat Stock Show circles; it represents the highest possible achievement in this department of British Agriculture. Keen rivalry is always shown amongst feeders of the different breeeds of cattle in regard to beef production. No breed of cattle has come so well through this test as the Aberdeen Angus, for during the past seventeen years it has won nine championships as against eight for all the other twelve breeds combined. This is a most notable record and the mere mention of the fact is sufficient proof of the superiority of this breed of cattle over the others in the realm of beef production."

Writing further on the successes of Aberdeen Angus Cattle: "There has not been a show of any consequence at which the champion honours have not been won by an Aberdeen Angus animal, or by an animal largely bred to that breed. Not only has this been the case, but the great bulk of the subsidiary honours at these shows also fell to animals of the same lines of breeding, a remark which applies equally to the live stock and to the carcase classes. It is impossible to over estimate the practical significance attaching to these striking results; results which, it need not be recalled, have been repeated to a certain extent for a series of years. The one great lesson which they teach is that the best quality of meat cannot be produced where there is an absence of Aberdeen-Angus blood and that the more Aberdeen-Angus breeding is represented in an animal, the more nearly will it attain to the ideal fat show animal, and at the same time to the highest standard of the beef producing carcase."

Although Great Britain may be considered the home of the Aberdeen Angus the breed has never ceased in maintaining its merits in whatever country it has been adopted. In America the herds of Aberdeen Angus vie with those of Great Britain in taking leading places when put in competition with all other breeds.

A recent American pamphlet on "The Supremacy of Aberdeen Angus Cattle" gives an array of remarkable figures recording the awards at American Fat Stock Shows given to animals of the Aberdeen Angus breed.

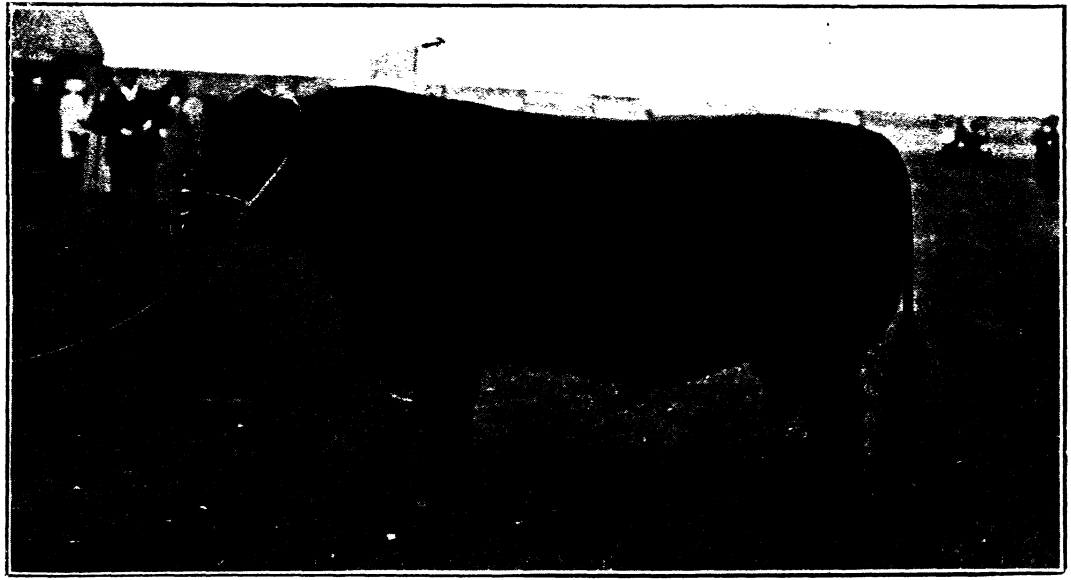
A summary of the Chicago International Exposition awards for the past nine years informs us that in the single steer and heifer competition: "Out of 261 possible places, Aberdeen Angus won 41.7 per cent., Herefords 32.9 per cent., Shorthorns 14.9 per cent., Galloways 1.1 per cent., mixed 9.2 per cent."

"Out of the grand total of 93 champion awards, Aberdeen Angus won 46, Herefords 31, Shorthorns ten, mixed six."

In the Fat Car Load competion covering the same period: "out of nine possible Grand Championships offered for best Car Load, Aberdeen Angus have won seven times and and Herefords twice."

At the recent Christmas Show at Aberdeen, Angus was champion and reserved champion over all breeds. An article by Mr. Henry du Plau, judge of car-load lots at the International Livestock Exhibition, Chicago, 1907, thus gives reasons "Why Stock-yard Buyers Like Black Polled Bullocks":—"Black cattle have by consistent and meritorious performance on the block earned the reputation of 'honest bullocks.' Where the Angus accentuates its popularity is in its ability to dress out a higher percentage of good beef at any stage of its career, from baby size to the bullock of mammoth proportions. The Angus cross makes an attractive animal, as the popularity of the blue-grey in British markets proves conclusively. A load of black bullocks of the same quality and finish as a load of any other kind will invariably elicit a bid ten cents higher than the buyer would feel justified in offering for others. He has by long experience determined, in his own mind at least, that results justify him in doing this. The statement that the 'black' is an 'honest bullock' explains this. It so happens that the blacks carry a large percentage of their weight above a line drawn midway and horizontally through the carcase. The neck is short and the hind quarter well filled out. When decently bred the Angus carries a high percentage of desirable meat of excellent quality, fine-grained, mottled and compact. The meat is always thick on the rib, where it is worth money, and there is no excess of plate. Being short-legged the shank is not prominent in the carcase. The fact that they are hornless has been a factor in creating market popularity for black cattle, but more stress has been put on that feature than conditions justify. It is possible that the polled steer possesses superior meat from the standpoint of the feeder, but as a stock-yard buyer I do not believe the absence of horns gives the polled breeds any distinct advantage now that de-horning is so general. Whatever prestige the blacks enjoy is due to their dressing and cutting qualities."

In a "Review of International Exposition Carcase Contests, 1900-1908," Professor Wayne Dinsmore, Iowa Agricultural College, gives in detail the points of merit possessed by meat from Aberdeen Angus:—"A review of the carcase competition for the past nine Agricultural Live Stock Shows reveals the fact that Aberdeen Angus cattle and their grades



Aberdeen Angus Bull, "Everlasting of Ballindalloch," 24435
1st Prize at both the Royal and the Highland Society's Shows, 1908.
The property of Mr. Dill MacRae, Stenhouse, Thornhill, Dumfries.

(Illustration kindly furnished by the Proprietors of *The Live Stock Journal Almanack, Port Elizabeth.*)

have won 44 out of a possible 82 prizes. This is 53.6 per cent. of all money prizes offered. They have also won eight out of the nine championships for dress carcases. The facts given establish the right of the Aberdeen Angus to premier place on the books so far as the International Carcase Contests show; and the beef-house experts of Packington appear to consider that the record made by the Angus in the carcase contests does not materially exceed their daily performance on the block.

"Beef animals, to meet with general favour from packers and retail butchers, must dress out a good percentage, supply reasonably fine-grained meat, hang up carcases of good 'shape' and carry a high percentage of lean meat, with enough fat to give tenderness, juiciness and flavour to the meat, but must not carry too much fat, or uneven fat covering. These are the essentials, and all beef animals are measured as carcase producers by their excellence in the requirements named.

"The dressing per cent. made by the grade and pure bred Angus entered in the carcase tests in 1906 and 1907 was 64.97 per cent. for the yearlings and 65.48 for two-year-olds, while the representatives of other breeds averaged 64.32 per cent. for yearlings and 64.3 per cent. for two-year-olds. This shows a slight advantage in dressing percentage, but the difference is so slight that it is not safe to assume that the breed has in this any positive advantage over other beef breeds. In fineness of grain figures are not available, but in the judgment of the writer the breed has no advantage over equally well bred Shorthorn or Hereford cattle of equal age and finish. Shape or 'proportion' of carcase is closely watched by retail butchers. Carcases that are light in bone, close coupled, thick in valuable parts and light in cheap cuts, such as navel, chuck and neck, are preferred. So far as shape of carcase is concerned, the breed can be considered equal to, though not superior to, other beef cattle of good breeding. On three of the four essential carcase requirements, therefore, the Aberdeen Angus cattle have no distinct superiority, though these advantages are often times claimed for them. It is on the last point that the Aberdeen Angus have scored their carcase victories.

"The last requirement is a high per cent. of lean meat, with enough fat marbled through the lean to give juiciness, tenderness and flavour, without excessive outside fat. Meat of this kind is always in demand among consumers. It is not plentiful on the markets. Most of the beef sold is too lean. Such meat has no marbling of fat, very little outside fat, and is dry, tough and lacking in flavour when cooked. Of the beef that is well marbled altogether too much is wasteful in outside fat. Some carcases will show an inch of external fat, yet show very little mixture of fat through the lean. What is desired is bright red meat that is fine-grained and well marbled, but not to have to pay for an inch or two of external fat in order to secure the kind of meat required. Two carcases may show the right amount of external fat covering and be practically equal in all respects save marbling, but while one is well marbled the other is not. This indicates that one animal mixes the fat through the lean before building up any considerable amount of outside fat, while in the other, opposite tendencies prevail. This has been known to occur in animals that have received identical feed and treatment, and for this reason it seems clear that the tendency to marble the lean is due chiefly to the breeding of the individual animal.

"In the judgment of the writer the long list of carcase victories credited to the blacks from Aberdeen is due almost entirely to their superiority in this last essential carcase requirement. Some of the winners have not been so well marbled as they should have been, but on the average they have excelled their competitors in desired proportion of fat to lean. The most experienced men in the Chicago beef trade have given this advantage to the carcases of Angus cattle without knowing what breed they represented. This does not mean in all cases, but it does mean that the majority of carcases rated high on this point have been those furnished by Aberdeen Angus blood."

In the "Farmers' Annual" Mr. James R. Barclay provides an interesting article on the "Aberdeen Angus Element in Beef Production." On crossing he notes:—"If Ireland could send to Great Britain a supply of right good black polled steers, instead of the leggy, raw, horned stores that are too often seen at our marts, the store cattle trade would become

even more valuable to Ireland. A large breeder and feeder in Ireland has put it on record that in the Irish fairs the first cattle that are sold are the Aberdeen Angus crosses, and these go at £1 to 30s. more per head when a year old than any other variety. There, too, the Aberdeen Angus cross, whether made with the Shorthorn, the Hereford, or the native Kerry and Dexter cattle, are amongst the most useful stores for the feeder.

"An argument that is sometimes heard against the Aberdeen Angus is that there is a want of size. And it has to be confessed that an Aberdeen Angus bull may not fill the eye as does a Shorthorn bull may do, with his wider hooks and squarer frame. But appearances are deceptive, and there is nothing more deceptive to the eye of the uniniated than the amount of marketable flesh there is on the low-set, rounded, lengthy body of the black skin. His well-padded back, his full rump and loin and his lengthy, well-developed quarter all appeal to the butcher, who knows too by experience how little waste there is about the cattle of this breed, and how large a percentage of the best class of beef they will produce.

"It may be recalled that the Aberdeen Angus holds the record of the London Smithfield shows so far as the returns at the block are concerned, the record standing at 76¾ per cent. of dead to live weight.

"One of the most potent factors in the spread of Aberdeen Angus cattle has been the success of the mating results with other breeds. In the United States of America where, in the early days of the breed it was received with a considerable amount of prejudice, headway was made largely on account of the success with which the Angus could be crossed, though in regard to pure breds it sprang into popularity in America with a rapidity which is unexcelled in the case of any other breed of cattle.

The prolificacy of the breed and its power to reproduce its own characteristics, even when mated with different breeds, were very forcibly brought out when the breed was introduced to the large ranges of the States. Very soon the "high grade" Aberdeen Angus steer was in the ascendency in the meat markets of America, gaining for the breed and its

grades or crosses the proud title of "The Prime Scots of America.

"It has been found by experiment that Aberdeen Angus crosses weighed about 120lbs live weight at the same age more than crosses of other varieties.

"By using an Aberdeen Angus bull on horned cows, 95 per cent. of the calves were black and hornless, while in general formation the character of the sire was reproduced.

"A firm of Mexican ranchmen who owned large herds of high grade Herefords and Shorthorns found that their steers had a great tendency to develope bone. As a result of enquiries as to the best corrective of this tendency Aberdeen Angus cattle were introduced to impart the qualities of low standing, thickness of flesh, fineness of bone and early maturity, and the experiment was found to be an unqualified success."

In the present early stages of the cattle industry in Rhodesia breeders have much in their power either to make or mar the class of cattle that will come to be known as Rhodesian. It is, therefore, of essential importance to keep in view that the estimate of Rhodesian cattle as beef producers, will be strictly based on how much or how little the animals will conform to the standard set us by the cattle authorities in Great Britain and America; of which the foregoing extracts are a summary.

One among other reasons why the Aberdeen Angus breed should receive particular attention in Rhodesia is the outstanding fact that there is a native race of black polled cattle existing in considerable numbers throughout every district in the country.

Amongst every troop of breeding stock brought from Victoria there always occurs a variable number of polled cows and heifers—often about 10 per cent. Kraals are met with also in other parts of the country where this type of of cattle are even predominant, thus showing the permanence of character which attaches to the black-polled race, even under the promiscuous breeding allowed amongst cattle belonging to natives.

The persistency of such a type throughout the country cannot be attributed to abnormal animals being sometimes brought forth among horned stock, because in almost every instance a certain change accompanies the absence of horns and a structural appearance is given to the animals which invariably follows a certain type. The native black polled cattle in Rhodesia cannot be regarded otherwise than as a distinct and well marked variety and one which will breed true within itself. One of the accompanying photographs represents a common specimen of a native black-polled heifer. It will be observed that the outline of the head particularly, and also the frame to some extent, manifests a strong similarity to the Aberdeen Angus breed. It is moreover interesting to note that the beef qualities, as agreeing with what is most desired by experts, are possessed by these black polled animals in a much higher degree than by any other native South African breed. Every butcher in giving his experience relates that black polled beasts, no matter from what district, "kill" heavier and cut up better, than horned animals of the same apparent size.

Important elements of agreement take effect through the introduction of Aberdeen Angus among black polled native cows. The shock of crossing different breeds or unlike varieties is to a certain extent dispensed with whereby a greatly enhanced value can be imparted to a native breed by merely using a highly improved sire on an unimproved dam both having the same typical affinities.

While accepting the doctrine that native breeds should be utilised in building up herds that will best conform to the circumstances of the country, yet if improvement is to be sought at all it can only be by the introduction of fresh blood. Thus, it would take interminable generations, breeding native stock by themselves or with Africander, before an animal could be brought out that would be equivalent to, or take the place of, a Shorthorn, a Devon, a Hereford or a Friesland. Similarly, it would take a very extended period, breeding with native black polled cattle alone, before an animal would be produced having all the qualities of an Aberdeen Angus But Rhodesia possesses in this native polled type a variety of cattle already in the country which presents similarities to a well-known British breed and offers points upon which

improved blood can be infused, that will become fixed and permanent in establishing an improved race.

A much greater difference lies between Shorthorn, Devon, Hereford or Friesland, and any of the native types, than between Aberdeen Angus and the native black polls. Thus the first cross between a pedigree Shorthorn bull and native cow follows to the greatest extent the Shorthorn type; but this first cross, if bred from either sex, will throw mixed progeny, only about one in five having the superior character of the Shorthorn, the rest grading backwards towards native types. Pure bred bulls are essential for many generations—six or seven—before the progeny of graded animals can be relied on to breed true, and by that time they are Shorthorn in every character although modified in some degree constitutionally by a remnant of native blood.

Breeding with pure bred Aberdeen Angus bulls and any of the horned native cows will be followed with similar results, and if persisted in long enough, a breed will be got having all the attributes of Aberdeen Angus, in the same way as with the Shorthorn or any of the other breeds mentioned.

The accompanying illustration demonstrates in a striking manner the improvement in the first cross out of native stock by an Aberdeen Angus bull. Both parents and the offspring are shown. The calf is 3½ months old and shows every indication of its sire's breed, and gives promise of size, substance and early maturity. The herd to which these animals belong is the property of Mr. J. A. Page, of No. 3 Ranche, Fort Jameson, and the bull one of twenty, including ten Aberdeen Angus, imported on behalf of breeders in 1907 by the Administration of North-Eastern Rhodesia.

In the case of Aberdeen Angus and the polled native animal no crossing of contrary types takes place. It is a case of infusing superior blood into an already established breed of similar model. The same is true of the Africander, a breed which may be regarded as standing in like close relationship to native horned cattle that Aberdeen Angus does to native polled cattle. There is undoubtedly

more racial agreement between Africanders and native horned cattle than happens with European breeds, and hence there is much less abruptness in crossing.

The idea seems plausible and it has been advocated by some authorities that Africanders are the most suitable breed to employ for the improvement of native stock. Cattlemen are wise, however, who first have a look at the results and compare them with the ideals. They will find good grounds for disputing whether any improvement is gained at all through Africander blood in the matter of getting a beef animal. As a trek bullock the Africander is unmatched in this or in any other country, but as a beef animal when examined by the light of those points held to be essential, he falls to a very low place indeed. As a beef animal the native is superior, and it is seen in the crossing results that so far from a gain in beef qualities being acquired, any change has even been retrograde. The qualities of the Africander lie in strength and not tenderness of muscle, in bone, sinew and viscera being highly developed, and all these attributes are transmitted to the progeny.

European breeds if more tender, have the essential merit of higher development for the purpose they are to serve. Thus, from an Aberdeen Angus bull and a black polled native cow, the first progeny both sire and dam, are more likely to breed true as to type. The breed having similar tendencies on both sides, improvement is wholly directed in these directions, and these, as in all other cases, gain by selection. In Mr. Partridge's herd at Lendy the calves now being yielded by black polled native cows from his Aberdeen Angus bull bear out unmistakeably the identity of type of both sire and dam. In so far as outward structure is concerned no trace of cross can be observed, the breed characters being identical in each calf and although following after the sire are yet not different in appearance from the dam.

It is in the qualities of size, of more rapid growth and of uniformity that improvement is looked for through the influence of a highly-bred sire. The qualities of the native animal in the cross adapt it for the prevailing conditions of the country, and are not necessarily obliterated before a valuable and permanent breed becomes fixed. Such a fixed type

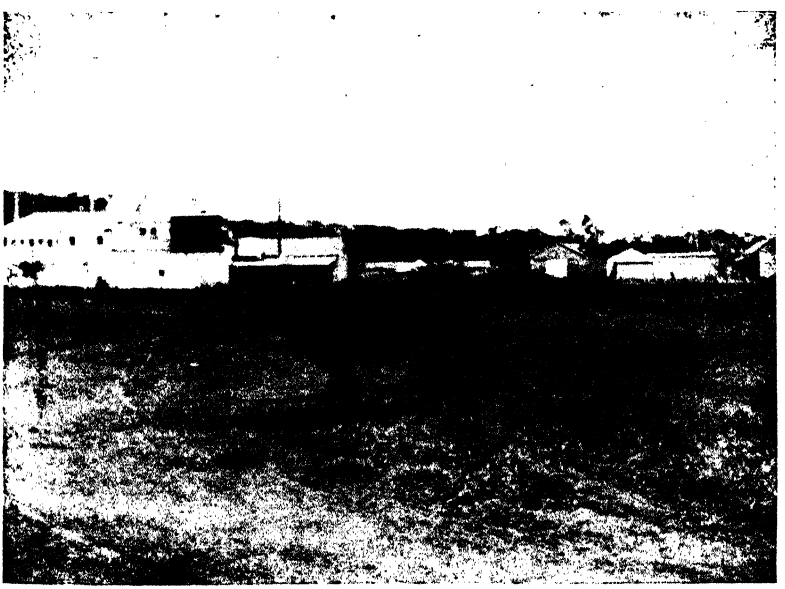
remains sufficiently plastic for improvement through selection.

It must be acknowledged that this cattle breeding experiment at Lendy has more of the elements that invite success than anything that has hitherto been tried in Rhodesia. The best method of establishing a Rhodesian breed of cattle, which will make its way in the markets of the world, is by improving an already existing animal of the same type, as in the case of the Aberdeen Angus and the Native Poll. If called upon to find markets beyond our borders for our surplus, it is only as a beef-producing industry that cattle raising need be expected to make headway. By laying the foundations of a good beef breed now, much waste and disappointment will be saved when the time comes (now not so far distant) when the value of animals will be fixed on their export qualities.

It is the pre-eminence of Aberdeen Angus in producing animals having these qualities and bestowing them on all its crosses that renders the breed of such high importance to Rhodesia.



Imported Aberdeen Angus Bull, Native Cow, and Cross-bred Calf three and a half months old, the property of Mr. Page, Fort Jameson, N.W.R.



A Native Mashona Black Polled Cow.

Winter Feeding of Farm Stock.

By H. GODFREY MUNDY, Agriculturist and Botanist.

What little significance have the words forming the heading of this article to the great majority of Rhodesian stock-owners. A few dairy farmers are beginning to grow winter feed, but ever with these, pumpkins and maize stalks form the generally accepted diet, assisted in rare instances by the addition of linseed and still less frequently by silage. In travelling through the country one asks the question: "Do stock receive any extra feed in winter?" Usually the reply is to the effect that the maize stalks are quite sufficient, or if ranching is the particular line of farming followed, the answer will be that early grass is abundant. The speaker has probably often given the matter some consideration, but it seldom occurs to him how little real nutriment there is on the early burnt veld, or how inadequate is the feeding ration formed by dry maize stalks which remain on the land. Few Rhodesian farmers are so well endowed with this world's goods that they can look with equanimity on the loss of two or three head of stock each year, yet if statistics were available of the number whose death each winter is due to nothing more or less than poverty, we venture to think that these would form a very appreciable percentage. Perhaps farmers cannot afford to be sentimental, yet the lot of the unfortunate beast who through neglect becomes too emaciated and weak to travel in search of fodder, is indeed a hard one—in many cases a sharp knife and food for the "boys" if not a more lingering fate. In the majority of these cases were winter feed available, the same animals would come through in normal condition, and in the case of old worn-out cows and oxen, instead of being written off as a dead loss, would bring in something to the farm account when sold for beef the following summer.

In the back of every farmer's mind is the wish to possess good well bred stock, and many are now finding means to gratify this desire by the importation of well bred heifers and bulls from the Cape Colony or oversea. Of what avail

their efforts if provision is not made for winter feeding? Calf flesh once lost is seldom regained, and an animal stinted when young seldom grows out well. The way in which the native Cattle, Angoni, Victoria, etc., maintain their condition under the most trying circumstances is little short of marvellous, yet it must be remembered that these are small framed active animals, and do not consume the same actual bulk of food that a larger and finer bred animal requires. Many of our farms are far from being heavily stocked, but each year the number of cattle is increasing, and through the introduction of pure bred bulls, the general quality and weight of carcase of the animals is being raised. In addition many men, not satisfied with the slow process of improvement by breeding up by selection, are importing well bred deep fleshed heifers.

Under such conditions it stands to reason that with strains of native stock and with imported cattle—animals of all ages being larger and heavier than those previously raised on the farms—more feed per head is required. The question every farmer must ask himself is—can I, with the veld at my disposal and without providing winter feed, maintain these cattle in a thriving condition the year through, and if my feeding is likely to be at fault, of what use my efforts towards improvement by breeding?

The advantages of providing winter feed may be briefly summed up as follows:—(a) The feeling of security that, bar accidents, all stock both small and large will come through the winter in sound condition ready to take full advantage of the new grass when the time arrives; (b) The knowledge that young growing stock are being pushed ahead and are receiving no avoidable set-backs; (c) The fact that working oxen will be in good condition, and can be worked almost daily throughout the winter; (d) That a certain number of cows can be kept in milk and full advantage can be reaped from the good prices which fresh butter commands at such season of the year.

Against this must be set a comparatively small extra expenditure of time and labour which the growing of these crops will entail. Few farmers are in the enviable position of being able to honestly say that their stock would not be

the better for extra "keep," and with the great majority, if the question is given fair consideration, the verdict must be in favour of winter feeding.

The climate of Rhodesia is admirably suited to the growing of succulent crops suitable for conversion either into silage or dry fodder. In normal seasons, maize planting is completed by the end of December if not sooner, and there then comes a short spell of comparative slackness before all hands should be turned to the cultivation of the "rent-payer"—maize. How better can part of this time be utilised than by the planting of crops to provide winter feed? In most districts frosts are not general before the end of May, and a growing season of virtually five months is therefore assured. An abundant rainfall coupled with a high summer temperature is conducive to a rapid and luxuriant growth of vegetation, and thus if suitable crops are selected, good returns per acre may be expected.

The fact that heavy and often continuous rains are experienced during the months of January and February frequently makes it difficult if not impossible to cut and cure the natural veld grasses in the best condition. To secure good hay, grass should be cut when in full flower, and if delayed after this stage, the feeding value is considerably impaired, and the grasses become hard and woody. How frequently one sees stacks of hay which nothing short of rank starvation will induce animals to eat, and which when eaten contain but little nourishment. The growing of summer forage crops will entirely do away with this difficulty, since they can be timed to mature when the heavy rains are over, and they can therefore be cut and carried under ideal conditions.

There is a tendency to look with disfavour upon any crop which cannot be readily converted into cash. This is a short-sighted policy, and farmers should remember that stock is their greatest asset, and as surely as they are putting good food into their cattle, so they are putting money into their own pockets.

When the question of what crops are suitable for the purpose comes to be considered, there is such a varied choice that the difficulty is to know which to discard. What is meant by a well balanced feeding ration is now fairly gener-

ally understood. The phrase indicates that on analysis the ration will show a suitable proportion of carbonaceous compounds (starch, sugar fats, cellulose, etc.) as compared with the percentage of nitrogenous compounds (albuminoids or protein) present. In strictly scientific feeding the albuminoid ratio varies according to the age and class of animal in question, but for general farm purposes in this country a ratio of one of albuminoids to five or six of carbohydrates may probably be taken as a normal standard. With crops such as maize, sorghum, teosinte, sugar cane, manna, etc., the bulk of the constituents are present in some form of carbonaceous compound, while leguminous crops, as all varieties of beans and peas, ground nuts, linseed, etc., will supply to a great extent protein and albuminoids.

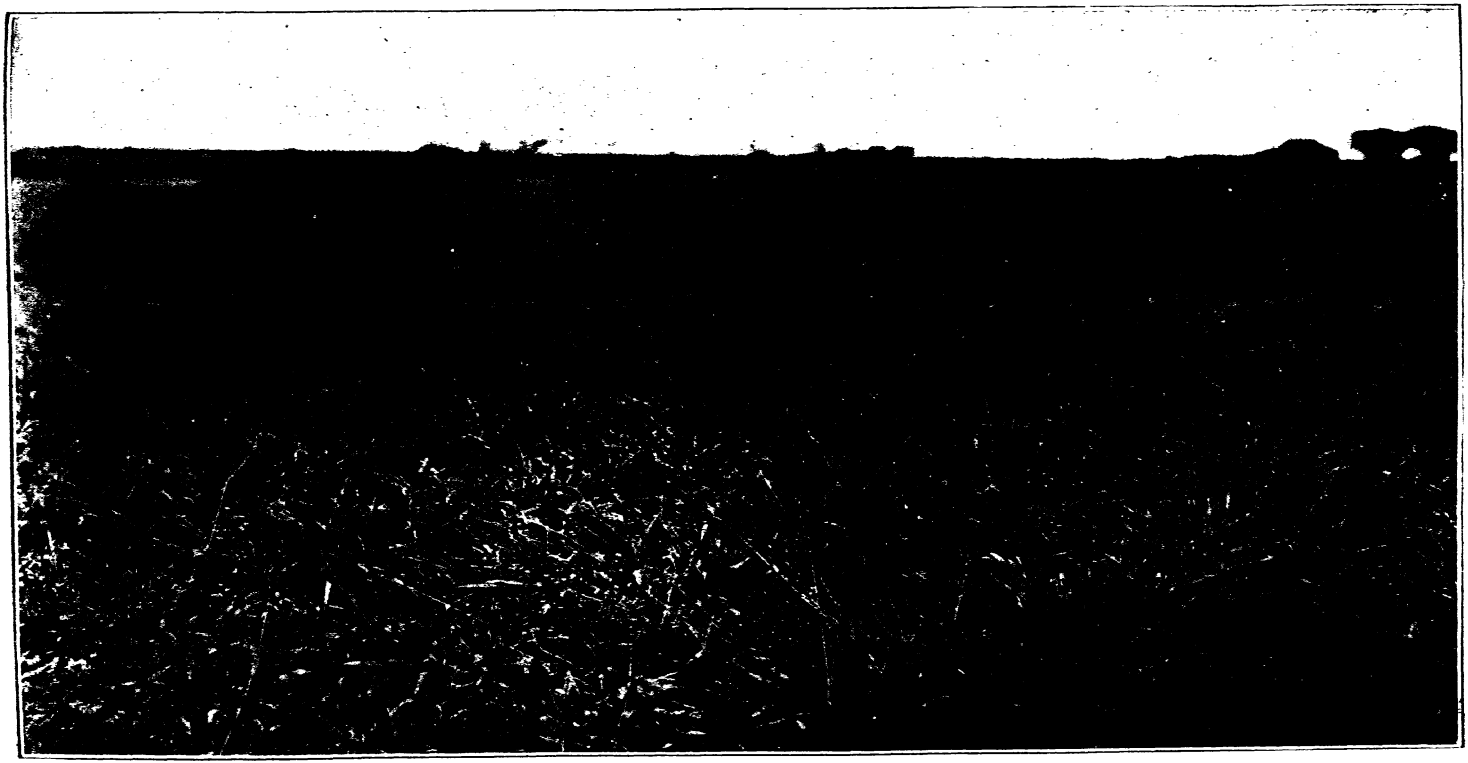
The value of a well balanced ration is of special importance in the feeding of animals doing hard and continuous work and in the case of dairy cows and young stock, but since by the growing of leguminous crops both this point and that of maintaining the fertility of the soil can be achieved at one and the same time, the principle recommends itself with additional force. Few farms are so short of arable land but that a few acres cannot be spared for growing these crops, while on a great many considerable areas are permitted to lie fallow each year with the object of regaining the fertility of which continuous cropping with maize has deprived them.

No farm animals will thrive their best on a ration composed solely of dry fodder. Some succulent feed is very desirable, and where root crops are uncertain pumpkins or silage form an excellent substitute.

CROPS SUITABLE FOR WINTER FEEDING.

MAIZE.

No better forage can be desired than that of well cured maize hay. In the United States of America and in Australia maize forage is considered of such importance that systematic experiments are carried out to demonstrate the best distance for planting and the most suitable fertilisers to use, and this is not for grain production but merely for hay. In growing for hay the object is to secure a thin stalk with as far as



Early Spring and Late Autumn Pasturage *(Paspalum dilatatum).*



Winter Pasture Cow Grass Clover *(Trifolium pratense perenne).*

possible an abundance of leaf development, therefore thick planting is essential. Drilling, though desirable, is not absolutely necessary, and thirty-five to fifty pounds of seed sown broadcast should give good results. If drilled, eighteen to thirty inches apart should be satisfactory. Weeds may prove troublesome, but these on old land mainly consist of Black Jack (Bidens pilosa) and sweet grasses, and these, though harmful to the crop, are in themselves of moderate feeding value.

SWEET SORGHUM (Sorghum saccharatum) or IMPHE.

This crop is at present but little grown by "whites." It grows well and forms an excellent forage if treated in the same way as maize. Kafir corn might also be utilised, but both crops contain poisonous properties when young, and although these are said to be volatile and to escape when the crop becomes wilted or on reaching maturity, there may be some danger in their use if not carefully handled. For use in silage when approaching maturity this crop cannot be surpassed.

TEOSINTE (Euchloena mexicana).

Teosinte has already proved its suitability to local conditions and is an excellent forage crop. It is slow growing but stools enormously and crops heavily. It prefers moderately rich land and should be sown in drills three or four feet apart each way. It is of particular value to dairy farmers in that it can be cut continuously throughout the season for green forage. With this crop growth is at first slow and cultivation should be resorted to to keep down weeds. About two to three pounds of seed is required to plant an acre.

SUGAR CANE (Saccharum officinarum).

The growing of sugar cane is rapidly gaining in favour and is proving of great value. The crop has the advantage of being perennial and is propagated either by cuttings or by rooted slips. It requires at least two years to come to full bearing, but once established grows rapidly and can be cut repeatedly. Being a perennial it is advisable to plant sugar cane on good land, and since it is a gross feeder liberal dressings of manure will always be well received. Successful results have been obtained here by planting in rows eight

feet apart, the plants two-and-a-half to three-and-a-half feet distant in the rows. At this spacing upwards of two thousand plants will be carried per acre.

PEARL MILLET "Munga" (Pennisetum spicatum).

This is largely grown by natives during seasons of drought. It crops well on poor land and is quick in maturing, therefore, being useful as a catch crop. If sown thickly the forage is of good quality and suitable either for hay or silage.

BOER MANNA (Setaria Italica).

There is no better crop than this for taming new land, and when maize follows the second year better crops are frequently reaped than when maize also has formed the first year's crop. The plants make a dense mass of fibrous roots and these ramify through the soil and thoroughly pulverise and aerate it. When cut early, before the seed heads become harsh, it forms an excellent forage, the value of which is far too little appreciated by Rhodesian farmers. A moderately fine seed bed is desirable and seed should be sown broadcast at the rate of twelve to fifteen pounds per acre. Thinner sowings are advisable when the crop is to be grown for seed. Boer manna requires about four-and-a-half to five months to mature.

JAPANESE MILLET (Panicum crus-galli).

This millet is rapidly gaining in popularity and is particularly suited for sowing in wet situations. It seldom or never suffers from rust and the forage is of excellent quality, often being considered more palatable to stock than Boer Manna. The seed head is not bearded and there is therefore no danger of stock contracting sore mouths from eating it. Seeding is similar to that of Boer Manna, but Japanese Millet proves somewhat quicker in maturing.

TEFF GRASS (Eragrostis abyssinica).

It is a curious fact that though increasingly grown in the Southern Colonies Teff grass has advanced very slowly in favour with Rhodesian farmers. Those who have once tried it seldom discard it, and it is such a quick grower and cures into such excellent hay that it is remarkable its value is not better

appreciated, Under favourable conditions the crop, which is an annunl one, is ready to cut eight weeks after sowing, and if sown early can usually be reaped twice. Beiug a quick grower weeds have little chance against it and it therefore forms an excellent smother or cleaning crop. Seeding is at the rate of four to six pounds per acre. The seed is very fine, and if harrowed at all, this must be done very lightly. The Department has seed for distribution and farmers are confidently recommended to give this crop a trial.

VELVET BEANS (Mucuna utilis).

This crop has proved a success in Rhodesia. It grows luxuriantly and provides forage of good quality. Is somewhat slow growing and should be sown early, at the rate of about 30 to 40 lbs per acre in drills three to four feet apart. The beans and pods become very hard when mature, and for the purpose of hay the crop should be cut when the beans are just formed. An excellent feeding meal is made by grinding the pods and beans together. The forage is succulent and is somewhat hard to cure. Care must be observed that is quite dry before stacking or baling, otherwise it is likely to heat.

COWPEAS (Vigna catjang) Kafir Beans (Vigna catjang var).

Both these crops are well known and the kafir bean is already grown largely by natives. Being well acclimatised to the country, this crop is an almost assured success and appears in no way inferior to the imported varieties of cowpeas. Sowing and treatment is the same as for Velvet Beans. Both Velvet Beans and Kafir Beans can be strongly recommended for planting on old lands which would otherwise be permitted to lie fallow, and in that the production of seed is not of vital importance, the damage which is so frequently done by beetles to varieties of beans grown for human consumption becomes an unimportant consideration.

In the making of silage a mixed fodder composed approximately of two thirds maize stalks, teosinte, etc., to one third leguminous crops has given excellent results.

GROUND NUTS (Arachis hpogaea).

As already pointed out in an article on ground nuts (Agricultural Journal Vol. VII., No. 2), the forage of this crop

is of good feeding value and should be carefully preserved. If harvested before fully mature, a large proportion of the haulm and leaves is retained and forms excellent feed for cattle or pigs.

LINSEED (Linum usitatissimum).

This crop also does well in Rhodesia and is already being sown fairly largely. It grows quickly and is of importance on account of the value of the seed. For dairy cows it should not be fed in too large quantities, otherwise it may have an injurious effect on milk for conversion into butter, but as a standby for feeding to unthrifty animals or for use in calf gruels it can be well recommended.

Seed should be sown broadcast on well-prepared land at the rate of 30 to 40 lbs per acre. Land repeatedly sown to this crop becomes linseed sick and a fungoid disease known as "wilt" often makes its appearance; change of ground is therefore desirable. The crop is such a valuable one that good land should be devoted to it. On poor soil results will not be satisfactory.

ADDITIONAL CROPS.

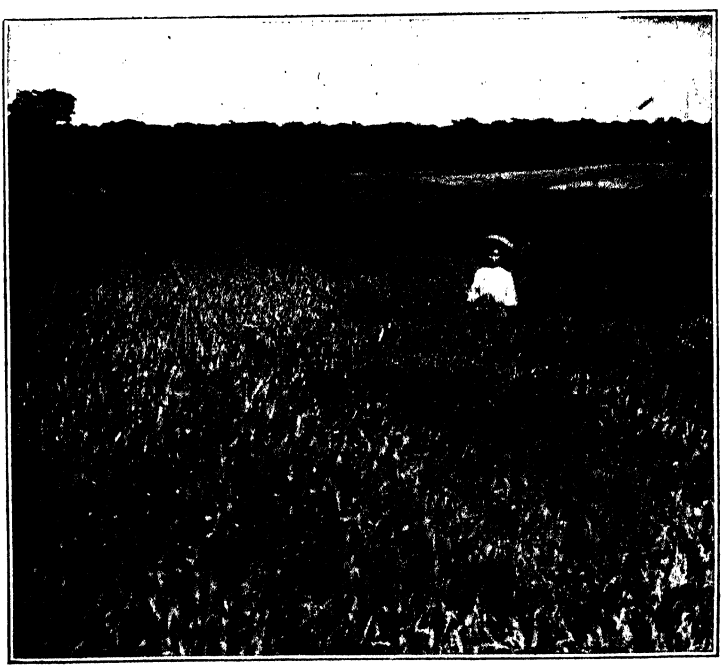
Other crops which will suggest themselves as suitable for providing winter feed are pumpkins, sweet potatoes (Ipomoea Batatas P.), rape (Brassica campestris), and Cassava (Manihot utilissima), but the cultivation of these is fairly well known, and space will not permit of their being fully dealt with here.

We are frequently asked the question: Is it advisable to plant bean crops between the rows of maize? Speaking generally one can give an unhesitating reply in the negative. On the other hand, when planting the crop for green fodder a mixed sowing will often give good results, but in this case the rows should be spaced much further apart—from five to six feet—and the bean crop should be planted first in drills and cultivated once or twice, after which maize can be sown broadcast between the rows.

With Rape, which is of particular value where sheep or ostriches are run, a good plan is to drill or sow by hand one row between each row of maize, but unless grown solely for



Winter Wheat—grown on moist land without irrigation.



Winter Barley—grown on naturally moist land without irrigation.

green forage this should only be done when the maize does not promise to make a good crop. Rape may be sown from the middle of January onwards, and some farmers claim that if the maize turns out badly, the rape does well and vice versa. With this crop maize is of course sown first.

WINTER PASTURE GRASSES.

But little has been done so far in the way of establishing winter pastures. There are large areas of moist vlei soil in this territory which give every promise of being suitable for the purpose, and on which Paspalum dilatatum will without doubt succeed. Other grasses worth trial are Cocksfoot (Dactylis glomerata), Tall Fescue (Festuca elatior), Yorkshire Fog (Holcus lanatus), Burnet (Sanguisorba minor), Cowgrass Clover (Trifolium pratense perenne), etc. These plants have all proved themselves good frost and drought resisters, and though without further trial it would be unwise to sow largely, yet the advantages to be derived from a green pasture throughout the winter months are so great that farmers may be strongly recommended to take advantage of the offer of seed for experimental trial, details of which will be found among the Departmental Notices.

WINTER CEREAL CROPS WITHOUT IRRIGATION.

On the same naturally moist soils some farmers have already tested winter wheat, oats and rye without irrigation, but we have not yet heard of these crops being used for winter grazing. If the crops are sown early, this can frequently be done, and far from injuring the plants, it causes them to stool out more strongly. Pastures of this nature are particularly desirable where sheep are run, and the stock would naturally be taken off sufficiently early to permit of the crop running into head before the commencement of the rainy season.

By the growing of winter feed and by the establishment of winter pastures, the stock-carrying capacity of our farms can be vastly increased, mortality will be minimised, and the general health and condition of the animals will be greatly improved.

Two Fruit-Eating Birds.

By C. F. M. SWYNNERTON, C.M.B.O.U.

"The Bulbuls (Pycnonotus), of which South Africa possesses four species, live almost exclusively on fruits and berries; so they can hardly be termed anything but enemies of the farmer. Indeed, their depredations to the fig and apricot crops in the Transvaal are beyond forebearance, as they present themselves directly the fruit commences to ripen, and devour all those which ripen first, just as the fruit is 'on the turn,' and scarcely fit yet for human consumption." (Haagner & Ivy "Sketches of South African Bird Life"—p. 51).

This represents the extreme view with regard to our common Bulbul, the "Tiptol," "Toppie," "Blackhead," or "Geelgat" of the settlers and the "Igweturi" or "Ipotwe" of the natives (P. Layardi, of Gurney); and, as always in matters of this kind, the extreme view is the view that prevails.

I may say at once that the above statement, however true it may be for the Transvaal, is absolutely inaccurate so far as the Rhodesian bird is concerned. Whether it will take more to fruit as orchards increase remains to be seen, but as things now stand it feeds about equally on fruits and insects. As the vast bulk of the former are wild fruits, and as the bird possesses several special advantages as a destroyer of noxious insects, there can be little doubt that a careful investigation would place the Bulbul in that much-maligned category of the birds that do an appreciable amount of harm but vastly greater good.

In support of the first portion of this statement, I cannot do better than quote from a previous article of mine on the subject (Ibis, 1908, p. 66): "As it is a matter of dispute whether this bird's ravages in the settlers' orchard are counterbalanced or not by its destruction of harmful insects, a detailed list of the stomach-contents of nine bulbuls, secured at one shot while destroying one of my papaws, may be of interest:—mulberries only; a large seed and much

insect débris, including a white ant; fruit pulp (pawpaw) and one *Physalis* seed; three leguminous seeds and eight insect remains; much débris of a large metallic bug, common on the 'Musuguta' (a large *Croton*); two or three seeds of *Physalis edulis* (the Cape gooseberry); three Reduviid bugs only, nil; skins of berries. Of six other stomachs examined half have contained fruit (wild figs, *Lippia*, etc), and the other three insects."

I may add to this that I have since examined a number more; that I last year placed a fledgling in a cage just outside my verandah, and daily, sometimes for an hour or more at a time, watched its parents feed it through the bars; that I have kept and am now keeping a number of these bulbuls in captivity; and that the evidence from all these sources fully bears out the conclusion already stated, that the bird is only semi-frugivorous. The captive birds return most eagerly to grasshoppers, etc., even after only a few hours on fruit alone, and show the greatest keenness and dexterity in tackling even difficult insects; and this is by no means due to sheer "insect-hunger," for they are given a liberal and varied supply daily. In the case of the young bird, the insect that was brought to it in by far the largest numbers was a particularly destructive cockchafer and, next to that, a common grasshopper that has regularly in past years devastated my young tobacco plants. The fruit, until I actually placed split bananas on the cage, was entirely wild, chiefly the berry of a common Cissus, and this though there was plenty of fruit ripe at the time in my orchard. The bananas which I have just referred to were utilised freely and much less of the wild fruit was brought when they were available, but the supply of insects was in no wise diminished.

Leslie Andrews, in Ceylon (Proc. Ent. Soc., 1908, p. 17) noted that a pair of red-whiskered bulbuls not only fed their young to a very large extent on insects, but included amongst them beetles, moths and butterflies belonging to groups that are exceedingly distasteful to the average bird.

This brings me to my second point—the bulbul's special advantages as an insect destroyer. It is, as I have just

indicated, somewhat indiscriminating in its choice of insects. The "lady-bird" that riddles the foliage of our potatoes, the large evil-smelling bugs and the numerous species of small and usually brightly-coloured beetles *(Phytophaga)* that attack our trees and vegetables and the sluggish brilliantly-striped grasshoppers that devour our tobacco are, one and all, comparatively immune to the attacks of birds in general.

But the bulbul, if I may judge from my captive individuals, takes longer than most birds to make up its mind that any particular insect is one to be avoided (that is to say, young bulbuls, still learning, will be responsible for the destruction of an exceptionally high proportion of distasteful insects); and, even when it has made up its mind, it requires no great degree of hunger to persuade it to return once more to the insect that had previously disagreed with it. It will readily be admitted that a bird with such tastes is capable of being no mean friend to the grower of crops provided that it occurs in sufficient numbers to really exercise a restraining influence on the insect life of the country. This condition is fulfilled in the case of the bulbul which is by far the commonest bird throughout this portion of Africa. It must also be remembered that this bird, more particularly than any other, is in the habit of frequenting our homesteads and cultivated ground.

That the black-capped bulbul is responsible for a great deal of damage to fruit I will not deny, although I have frequently seen it blamed for wholesale destruction that had actually been committed by colies. Each man must decide for himself whether to shoot it or encourage it. Personally, had I a market for my fruit, I would prefer to net it rather than dispense with the aid of so invaluable an ally; and bearing in mind their vast preponderance in numbers over any other of our insect-eating birds I cannot help feeling that it will be a sad day for the agriculturist when anything like a general campaign of destruction is directed against the bulbuls—our friends of the dull brown backs, black topknots and brilliant yellow under tail-covers.

It may be thought that I hold a brief for the bulbul. I hold none for the coly, or, as it is perhaps more commonly called, the "Mouse-bird," nor can I too strongly advocate its whole-

sale destruction. The grey-brown "speckled" mouse-bird with prominent crest and hugely elongated yellowish-brown tail (*Colius striatus minor* of ornithologists and "Indhlaze" of the natives) is by far our commonest form here. I have found it vastly more destructive than the yet more common bulbul, and the following notes (Ibis, 1908, p. 404) accurately describe my annual experience of it:—

"In 1906 they attacked my peach-crop in August, when the fruits were still quite small and hard, usually in a flock of from twenty to thirty individuals, and did great damage, leaving quantities of bare stones attached to the twigs. Fortunately they have the habit when alarmed of congregating together in small groups, so that several can be brought down at one shot. Shooting them wholesale, however, does not frighten them in the least; we killed upwards of fifty in comparatively few days, but the numbers in the flock always remained fairly constant, fresh birds appearing from the veld to fill the gaps. On August 17th we reduced the flock to three birds, but within three days it had again increased to thirty-five. I examined the stomach-contents of all that were killed and only in a single instance did I find anything but fruit, wild or cultivated, the exception being a larva which had doubtless been swallowed accidently in the fruit. I have also found green leaves in the stomach." In the stomachs of the rarer red-faced Mouse-bird *(C. erythromelon)* my friend Mr. David Odendale has even found the fresh pulp of oranges, a fruit which I have never seen attacked by the commoner species.

In conclusion I would strongly urge on those who, like one or two of my acquaintances, advocate the formation of clubs for the destruction of birds in general, the consideration that after all, their feathered enemies are limited to a very few species; and that by an indiscriminate use of poisons or the barbarous native bird-lime, they will probably be doing themselves more harm than good; and that there is a good deal to be said even for some of the "enemies."

Poultry.

By PHILIP L. HALL, Lenham Farm, Syringa.

[CONTINUED.]

THE USE OF PURE BREEDS.

The greater majority of poultry keepers in Rhodesia will find it advantageous to possess a pen of pure bred fowls, even though their main business be carried on on utility lines. It does not take the new settler long to realise that if he wishes to keep a few fowls successfully he cannot rely upon the native bird, and as the country becomes more settled the demand for good poultry is sure to increase. The newcomer will find it a wiser economy and a sound investment to pay a few pounds for a few really high class utility birds from a reliable breeder and be content to wait a few months and rear the progeny, than to purchase a host of kafir fowls, for, so far as utility goes, one might as well breed sparrows. It is my purpose here to give a few hints to those who are anxious to make for themselves a name as breeders of a particular breed in the most effectual and expeditious way. The beginner must not expect much return at first, especially if he is not able to pay a good price for his birds, as he will have to breed up to a high state of perfection, which takes time, and then he will have to make his name known before there will be any great demand for his stock. The show-yard is the breeder's opportunity. Supposing his birds to be worth exhibiting, he must show them and take as many prizes as he can, for there is no better way than that of making himself and his stock known to the poultry-keeping public. Advertising is very useful, and in most cases indispensable, but by winning prizes one is advertising in a much more convincing manner. A would be buyer may read an announcement of stock or eggs for sale, and no matter what care may have been exercised in judiciously wording he is likely to be sceptical, but a prize gained is incontrovertible testimony, and the higher the quality and the better the victory, so much the more will people be anxious to possess the winner or his or her progeny. Having bred a bird up to a state of excellence sufficiently high to justify

one in exhibiting it, the first thing to do is to have it properly prepared. Every year we see really good specimens which do not stand a chance of winning owing to their being in the hands of amateurs who do not know how to exhibit them. They must be tame, accustomed to being handled, clean and in fine condition. The specimen to be exhibited must therefore go through a period of training in a pen or cage similar to those that will be in use at the show. The length of time this process will require entirely depends upon the bird. If it is naturally of a quiet disposition and has been well reared, a week or ten days will be sufficient. In this respect the poultry keeper who rears his birds from the incubator has a great advantage over the birds reared by hens, as the former are invariably more docile, being hand-fed from the commencement. If the bird be out of condition and wild, three weeks and even longer may be required to get it ready for exhibition. The owner must use his own judgment in this matter, but in any event, it is no use taking a bird direct from the breeding pen or yard, as the case may be, and sending it into a show and expect to win prizes. It is not likely a judge is going to waste time trying to give the correct points to a bird which is all the time doing its best to make an exit for itself through the top of the cage. Any judge is quite justified in passing such a bird and awarding the prize to a not improbably inferior bird if properly trained. Aspirants to show honours must remember that when placing birds for exhibition it is absolutely necessary they be in a fit and proper condition to be exhibited, otherwise they need not express surprise that their birds received no cards. If the bird is at all wild when put into the cage for training it must, of course, be treated very gently, and it is always advisable to cover it up so as to leave it in semi-darkness, gradually admitting more light as it becomes tamer. The training cage must be kept under cover and neither exposed to drafts or the direct rays of the sun. Should the exhibit be a white plumaged bird only sufficient light should be admitted to enable it to see to feed. From the commencement of the training the bird should be coaxed by giving very small quantities of grain and meat by hand until it becomes used to coming to the front of its cage. It will soon gain confidence and show itself off to the greatest advantage—just what is required in the show. The feeding of birds intended for show is an item of the greatest im-

portance and fraught with many dangers to the novice. In many cases the amateur fails to discriminate between the training pen and the fattening coop, and while it is quite correct to show a bird in good flesh, it is not likely to present the bright and active manners so necessary, if it be over fat and in a fit state for the table poultry class. The diet must be nourishing and easy of digestion. A little linseed meal may be added to the soft food in order to promote a good on the plumage, but this must not be overdone owing to its great heating powers. Black feathered varieties require most attention with regard to lustre of plumage, and linseed will do wonders in a short space of time in producing the brilliant sheen which should always be a noticeable feature in such breeds as the Orpington, Minorca, Leghorn, Wyandotte, etc. Green food in abundance is very necessary as thh means of keeping the blood pure, and in this respect has no equal. When such vegetables as lettuce and green onion tops, and for that matter the onions themselves, chopped up, can be given freely, the results are soon seen in the clear bright red of the comb and wattles, which not only denotes health but adds so much to the general appearance of the bird. Some meat or green bone ought to be given daily, the latter for preference. It imparts vigour and stamina, and in all breeds where size of comb is a desirable point, animal food will greatly assist in promoting growth. So long as the bird's appetite remains good three moderate meals per diem will not he too many. Should the bird fail to take food with proper relish a little carbonate of iron may be added to the drinking water and all food except green food may be withheld for a short period. Fresh clear water and grit must be regularly supplied and the greatest cleanliness observed, as no bird will thrive well if worried by insect pests. Before despatching the bird to the show the legs and feet should be well washed in hot soap and water, using a stiff nail brush. After drying, apply a little vaseline, which should be well rubbed in with the hand. The comb, beak and wattles are all improved by sponging with warm water, and the application of a very little vaseline or sweet oil will bring out the colour. in the event of an upright comb with the slightest tendency to lean over, anything of the foregoing nature should be avoided. Vinegar diluted with half the quantity of water is then the best to use. Any broken feathers should be removed and the plumage carefully stroked over with a

damp cloth; it is only necessary to actually wash white birds, and only then if they are dirty. An inclination to fake which some breeders seem quite unable to throw off should be strenuously avoided. Although the nuisance has decreased it is still very necessary for judges, stewards and exhibitors to practise the greatest vigilance. Any prize won by some unscrupulous trick is after all poor satisfaction, and should merit the most severe penalty from those in authority. Finally, I would always advise a beginner to go in for a self-coloured breed. The laced and pencilled varieties, also the barred, present great difficulties in breeding which even defy the efforts of old hands. There is an infinite number of popular self-coloured varieties, especially in buff and black. Never start with more than one breed. Do not commence exhibiting until you have something worthy, and above all, learn early the wholesome lesson of being beaten.

The Potato Tuber Moth.

By RUPERT W. JACK, F.E.S., Government Entomologist.

Rhodesian farmers are mostly familiar with this destructive little pest, which is indeed one of the worst enemies with which the potato grower in this country has to contend. It is distributed throughout South Africa, and occurs in many other parts of the world, where the difference between summer and winter temperature is not extreme. Of these may be mentioned California, Southern Europe, Northern Africa, Australia and New Zealand, which illustrates how wide its distribution has become. The following notes on the habits and life history of the insect have been partly compiled, and are partly the result of the personal observations of the writer on moths bred in captivity under conditions very similar to those of the storeroom.

The technical name of the insect is "Gelechia operculella," though the old name of "Lita solanella" is more generally known. The adult moth, like so many destructive insects, has a very insignificant appearance, as may be seen from the illustration Plate 1, figs. 1 and 2. The figures are slightly enlarged. The general colour of the fore wings is brownish grey speckled with darker brown. The hind wings are very light silvery brown. The pupae (Plate 1, fig 3.) are yellowish brown in colour. When very fresh they frequently show greenish patches (The reflection of the light has unfortunately given the middle pupa a speckled appearance which is unnatural). The pupa is enclosed in a moderately tough cocoon. The nearly full grown larvae are shown enlarged in Plate 1, fig. 4. The larvae are whitish or delicate pale green in colour, frequently with a strong blush of pink along the back. The eggs are white and very minute. They are deposited about the eyes or in other depressions in the surface of the tuber in the storeroom, and also in sheltered positions on the stems and leaves of the potato plant in the field.

As already stated the eggs are laid on the stems, leaves or tubers. It is not only in the storeroom that the latter position is chosen, but often in the field when tubers are expos-

ed by the cracking of the earth, or by being left out overnight after lifting. This is an important point in the life history of the insect, as will be seen when we come to consider preventive measures. The eggs hatch in from 7 to 9 days under storeroom conditions. The young larvae seem to wander about for several hours before penetrating into the tuber. It developes rapidly under our climatic conditions (these observations were made in September to October), and usually emerges full-fed in 19 to 20 days, though a few specimens appear to take much longer. In California where the insect has been studied, the larval period is given as from 6 to 9 weeks according to the temperature, so it is obvious that the rate of increase in Southern Rhodesia is very rapid compared with that of cooler countries, and the damage by the insect must be correspondingly severe. A number of pupae have been found in the tunnels in the tuber close under the skin. It is an open question whether these are the pupae from larvae which has not taken the trouble to leave the tuber to pupate, or those of larvae that have crawled into that position from outside. From personal observations the writer is inclined to think the former is the explanation, as frequently there has been no visible entrance from the outside near where the pupae were found. Usually, however, the full-fed larva crawls out and seeks a convenient spot to undergo its transformation. This is in most instances selected within 24 hours and the cocoon spun. The larva, however, does not pupate for another three days. The pupal period lasts about 15 days, which makes about 19 days from the time the full-fed larva leaves the tuber. The life cycle from egg to adult thus takes about 45 days, which allows of a good number of generations in a year. The insect in all stages is exceedingly hardy, and seems almost indifferent to moist or dry conditions. Pupae produced moths readily though kept in a perfectly dry glass tube. In one instance 10 pupae were kept in a dry tube and all produced moths. These moths were left in the tube, which was covered with gauze at the end, and were provided with neither food or water, and most of them were alive 9 days later, and one survived until the 11th day. The moths, however, drink water greedily when supplied to them.

In the adult stage the habits are nocturnal, the moths

mostly resting on the stems and leaves of the plants in the field, and amongst the tubers in the storeroom during the day. In an infested potato field the moths can be kicked up from the plants during the day, but quickly alight again. The writer has, however, on several occasions seen the moths in breeding cages perform the act of copulation in broad daylight, and once at twelve mid-day. The cages were also in a very light situation. Possibly this occurs frequently in the field. At night the moths are readily attracted to light.

FOOD PLANTS AND DAMAGE DONE.—The chief damage is done to the tubers in the storeroom, the pest increasing rapidly and attacking tuber after tuber and sack after sack, until a fine crop of potatoes may be rendered valueless, the tubers being bored through and through by the larvae. The tunnels also give many kinds of moulds and fungi, access to the tissues, and these energetically assist the process of destruction. The attack of this insect is commonly accompanied by that of the "White or Dry Rot" (Nectria solani). In addition to the destruction of the tubers, however, the injury to the stems of the plants in the field sometimes assumes serious proportions. During the past season at the Cape the writer inspected some young plants that were quite wilted as a result of the work of the larvae of this moth in the stems, which were tunnelled very severly, there being a larva almost to every node. The farmer stated that a considerable portion of the crop was affected in this way.

In addition to the potato, the moth is known as a pest of tobacco, the larvae mining in the leaves of the plant and doing extensive damage. It also attacks the wild "Datura stramonium" (Stinkblaar"), and probably many other Solanaceous plants.

Knowledge of the life history and habits of the moth has enabled potato growers to adopt a few simple preventive measures, which are effective in keeping its ravages within bounds. The main end of these measures is to avoid exposing the tubers at any time when the adult moths are active, in the first place in the field, and secondly in the storeroom. If the ground is allowed to become hard and full of cracks, so that some of the tubers are exposed, the moth is liable to deposit her eggs on them, and larvae are enabled to crawl down from the wilted tops and enter the tubers, and thus

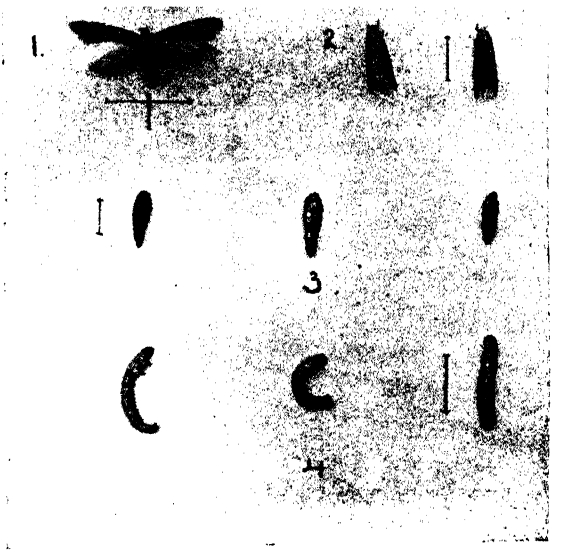


PLATE I.—Fig. 1, Adult moth, extended, enlarged; Fig. 2, Adult moths, enlarged; Fig. 3, Pupae, enlarged; Fig. 4, Larvae, enlarged.

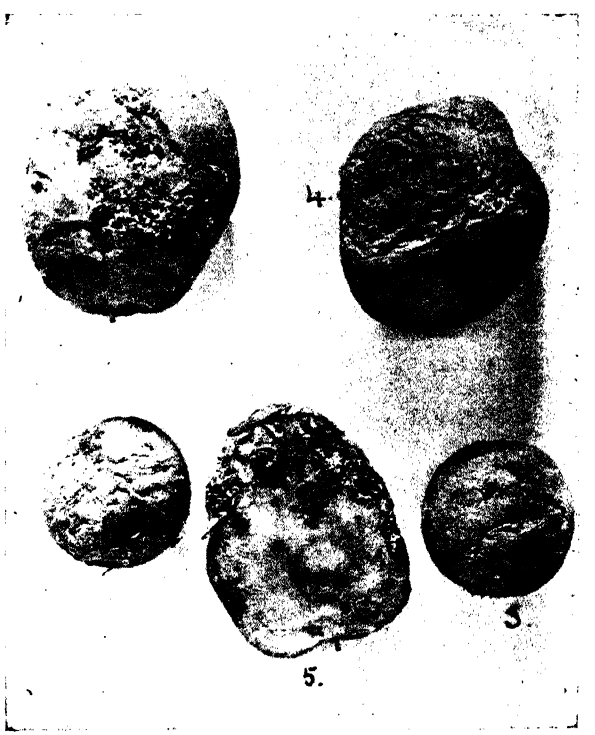


PLATE II.—Figs. 1, 2 and 3, Tubers showing external indications of moth infestation; Fig. 4, Tubers showing external indications of moth infestation, but injury supplemented by that of Dry Rot; Fig. 5, Section of tuber showing work of larvae.

form a ecntre of infection when the tubers are removed to the storehouse.. It is possible that larvae occasionally mine down the stems, through the stolons, and thus enter the tuber under the best natural conditions, but such occurences are admittedly very rare.

To avoid infection of the tubers the strictest attention should be paid to the careful hilling of the crop. It has already been mentioned that the larvae tunnel freely in the potato plants themselves. Before lifting the crop the field should be gone over and all the infested tops, which can be distinguished by their wilted appearance should be cut off and burnt. This will destroy a great many larvae which would otherwise be ready to bore into the tubers after they have been exposed. The nocturnal habits of the moths must be taken into consideration in lifting the crop, and no tubers must be allowed to lie about uncovered after sundown. If possible the tubers should be lifted and stored the same day, but if this is inconvenient, all those left over should be placed in bags, stacked up and adequately covered over. Mere bagging is not sufficient, as the moth is capable of creeping through a very small aperature. In Rhodesia the most convenient material for covering the bags will be hay. This may again be covered with sacking or with a bucksail. This method should be applied not only to the tubers left overnight on the field, but also to those in the storeroom. It serves the twofold purpose of preserving the potatoes from fresh infection whilst stored, and also of preventing the escape of any moths which may possibly have bred in the storeroom. It is considered that the moths which are bred from infested stored tubers and escape to the lands, constitute one of the liveliest sources of infestation to the growing crops. If the storeroom could be made moth proof by covering the windows and doors with fine gauze, so much the better, but the moths easily penetrate gauze which woul defy a mosquito. Gauze of the fineness of 24 meshes to the inch would be effective however. Sources of infestation like infested tobacco plants should, of course, never be tolerated near a field of potatoes. If these simple measures are attended to, the farmer's losses from the pest will become of small moment.

Certain remedies have been recommended for destroying the larvae on the plants, and the pest in all stages in the

tubers. The first of these consists of spraying the plants with an arsenical preparation such as Paris Green or Arsenate of Lead. Owing to their tunnelling habits the larvae would, in the general way, only absorb poison applied to the foliage when first entering the tissues of the plant after leaving the egg. In this way the treatment may be moderately effective, but the spraying would need to be careful and thorough. Arsenate of Lead is in every way preferable to Paris Green, especially in dealing with tender foliage. I do not know of any attempts at spraying for this insect in South Africa, and cannot answer for its efficacy as a remedial measure.

Fumigation with Carbonbi-sulphide is practised by a few for destroying the pest in the tubers, but it is an expensive remedy at the present price of that chemical in Rhodesia, and is not likely to come much into vogue. About a pound of Carbonbi-sulphide to every hundred bushels of potatoes is used. The fumigation can be carried out in a room or air-tight bin. Some even use a bucksail or tarpaulin and report good results. The chemical may be administered in shallow vessels placed on top of the tubers, or merely thrown over the sacks containing the potatoes. The exposure should be for 24 hours. A number of treatments at intervals of a fortnight has been recommended.

The adult moths are readily attracted to light at night, and various devices have been used in different parts of the world for taking advantage of this. The usual method is to suspend a light over a pan containing water covered with paraffin oil. The attracted moths will fall into this and at once succumb. Specially made Acetylene lamps are used against similar insects in some countries. Rough machines, made for dragging between the rows of plants, the light being thrown on to a white screen, with a receptacle beneath, have been suggested. The moths are disturbed from the plants by the passage of the apparatus, are attracted to the light screen, and fall into the receptacle below.

Potato growers will do best, however, to pay attention to the simple methods of prevention described above, and they will then have little need to bother with remedies. Prevention is better than cure.

Dates of Meetings of Farmers' Associations, Southern Rhodesia

(SUBJECT TO ALTERATION).

Name of Association.	Place of Meeting.	Secretary.	1910.										
			Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Mashonaland	Salisbury ...	W. H. Williamson ...	5	5	2	7	4	2	6	3	1	5	3
Rhodesia Landowners' ... Farmers'	Bulawayo ...	Harry Hopkins ...	24	31	28	26	30	28	25	29	27	24	29
Manica	Umtali	P. B. Snashall ...	5	5	2	7	4	2	6	3	1	5	3
Enkledoorn	Enkledoorn ...	A. J. Liebenberg ...	26	26	30	28	25	30	27	24	29	26	31
Lomagundi	Eldorado Mine...	J. J. Reynard	12	12	9	14	11	9	13	10	8	12	10
Makoni	Rusapi	F. A. Lapham ...	9	9	13	11	8	13	10	14	12	9	14
Marandellas	Marandellas ...	A. J. H. Nicholson ...	5	...	2	...	4	...	6	...	1	...	3
Matopos	Matopos... ...	W. E. Dowsett ...	...	6	...	...	5	...	...	4	...	...	4
Plumtree	Plumtree ...	J. Reid-Rowland ...	...	...	7	...	...	7	...	...	6	...	...
Victoria (Eastern)	Good Hope Farm	F. A. Readman ...	5	...	...	7	...	...	6	...	...	5	...
*Victoria	Victoria	James Rutherford ...	...	...	...	...	...	...	...	...	...	...	...
Midlands	Gwelo	T. Twilley ...	11	11	8	6	10	...	...	...	...	...	...
Figtree	Figtree	J. T. Kirschbaum ...	...	...	9	...	...	9	...	...	8	...	...
Melsetter	Melsetter ...	H. A. Oxenham ...	...	...	1	...	...	1	...	...	7	...	...
Gazaland	Chipinga ...	A. L. Sclater	...	3	...	5	...	...	4	...	...	3	...
*Mackeke	Macheke ...	A. C. Fountain ...	...	...	...	...	...	...	...	...	...	...	...
Hartley	Hartley	S. J. Kuntzen	5	5	9	7	4	9	6	10	8	5	10
Mazoe	Mazoe	V. W. Fynn	...	6	...	...	5	...	...	4	...	...	4
*Makwiro	Makwiro ...	W. Shaw	...	...	...	...	...	...	...	...	...	...	...

Dates of Meetings of Associations marked (*) are uncertain.

Reviews of Books.

CEDARA MEMOIRS, VOL. I.

By E. R. Sawer, M.A., Director, Division of Agriculture and Forestry, Natal; late Agricultural Assistant to the Department of Agriculture, Rhodesia.

By the courtesy of the Minister for Agriculture, Natal, we have received Volume I. of these memoirs dealing with "Cereals in South Africa," and based largely on experimental work, carried out during the last six years on the various experiment stations of the Natal Department of Agriculture. Leading references are also made to experimental work in the other South African Colonies, and in the United States of America.

The volume should prove of great benefit to Natal farmers, and likewise contains matter of much interest to agriculturists in other parts of South Africa. The opening chapters deal with Natal soils, tillage operations and Natal phosphatic deposits, while much valuable information is given regarding Maize:—varieties, yields, improvement by selection, analysis of grain, grain judging, times of planting, distance of planting and special methods of cultivation suitable for maize.

Subsequent chapters are devoted to "Cereals under Irrigation," "The Rust Problem," "Millets," "The Commercial Aspects," "The Place of Machinery," and "Export of Maize," while the various subjects dealt with are elaborately illustrated.

It is impossible to discuss so comprehensive a work in detail, but one point arouses interest, namely, the writer's reference to maize as an irrigated crop. Under the most favourable conditions the profits from maize cultivation are comparatively small, and while there remain such vast areas of land capable in normal seasons of growing maize as a rain crop, it is difficult to understand why with proper handling irrigable land could not be devoted to more remunerative crops, such as lucerne, tobacco, cotton, etc.

In discussing the cultivation of rice, Mr. Sawer expresses the opinion that the only variety suitable for dry cultivation is the Mashona rice.

On turning to the rust problem, we learn that summer sowings of wheat have in the main been disappointing and that of all the varieties of maize tested, Leaming and Golden Ball have proved themselves least susceptable to this trouble.

Referring to forage crops for hay or silage, Pearl Millet "Munga" (Pennisetum typhoideum) is favourably commented on owing to its capability to yield good crops on comparatively poor soils, while its drought resistance is reported to be greater than that of either maize or kafir corn.

"Cereals in South Africa" will afford much valuable reading to all interested in the agricultural problems of the Sub-continent, and the appearance of the continuation of the Memoirs in the form of "Feeding Crops and Live Stock Experiments" and "Tropical Agriculture on the Natal Coast" which are promised, will be awaited with interest.

H.G.M.

SOUTH AFRICAN POISONOUS PLANTS.

(Published by T. Maskew Miller, Cape Town. Price 1/-).

This timely little work has been prepared by Mr. L. H. Walsh of Cape Town, and dealing as it does with a subject about which but little is at present known, should prove of considerable help to stock owners throughout South Africa. As the writer points out in the opening paragraphs, there is some difficulty in drawing a hard and fast line between plants which are actually poisonous, and those which when eaten in certain conditions areinjurious to animal health. In this connection brief reference is made to hoven and bloat (Opblaas) caused by eating lucerne, green barley, green maize forage, etc., and to similar ailments, but in the main the book deals with plants known to contain active vegetable poisons. In each instance the symptoms are fully described as a guide to determining what plant may be suspected as the cause of trouble, while in addition instructions are given based on veterinary research throughout the southern colonies, for suitable remedies and after treatment.

A knowledge of the poisonous plants of a country can only be gained by practical and often bitter experience, but if carefully studied, this publication will go a long way towards opening farmer's eyes to those plants which should be regarded with suspicion.

The illustrations have been carefully prepared, but to those unacquainted with a plant, it is always a matter of difficulty to recognise it from a drawing or photograph alone. With the uninitiated, colour is the main guide, and since it is to the man without much local knowledge that this book will chiefly appeal, its value would have been considerably enhanced had the illustrations taken the form of coloured plates.

Brief botanical descriptions are given, and these together with symptoms of sickness and directions for treatment are expressed in the simplest terms, which can be readily understood.

We welcome the appearance of this little volume as a step towards a fuller knowledge of the poisonous plants of the sub-continent, and can confidently recommend it to the notice of South African farmers, to whom the matter is one of vital importance.

H.G.M.

THE BULAWAYO COOKERY BOOK AND HOUSEHOLD GUIDE.

By Mrs. N. H. Chataway. (Philpott and Collins, Bulawayo. Cloth 3/6, paper covers 2/6.

There is no doubt that Rhodesia is advancing in material civilization. Already it has its ports and railways, its press and its parliament; now it has, as the seal and crown of its advancement, its own cookery book.

No longer need the frugal bachelors' mess be contnet with hashed mutton, potatoes, and rice pudding. A brighter day has dawned; the whole world has been pressed into the service of the esurient Rhodesian. There are Durham Cutlets and Ccotch Eggs, Swiss, German and Yankee Puddings, Indian Chutneys, American Salads, and Boer Biscuits.

For festive occasions there are Roman Punch, Zambesi Cocktails, and last but not least, "The Knock Out." Moreover, both faddists and epicures are catered for; for the disciples of Mr. Eustace Miles there is Vegetarian Brawn, for the abstainer Tea Cup (very seductive), and for the gormet Fat Rascals and Boules d'Or.

Many cunning deviecs are unfolded by which familiar tinned stuffs may be so disguised that the Chicago packer

would find difficulty in recognising his own offspring.

Altogether, in fact, here is a very useful little book, founded on Rhodesian experience, and specially compiled for use in Rhodesia. So, walk up! ladies and gentlemen, patriotic Rhodesians all, and buy for your own advantage and the benefit of the Church Building Fund.

L.M.F.

(We are indebted to Mrs. N. Chataway who has prepared the above work for the press, the profits going for charitable purposes, for a series of recipes specially adapted for veld cooking, which we hope to publish, for farmers and others whose cuisine is necessarily limited and who are apt to suffer from the monotony and indigestibility of the compulsory simple life which these hints are hoped to diversify.—Ed., R.A.J.)

MAIZE CULTIVATION AND EXPORT.

A copy has been received of the Maize Brochure, published under authority of the Governments of the Cape, Natal, Orange River and Transvaal Colonies, and entitled "Maize Cultivation and Export." This publication takes the form of a booklet of 55 pages, and is tastefully got up, and illustrated with numerous excellent photographs, showing the various stages through which the grain passes on its way to the European market.

Valuable statistics are given and chapters are devoted to climatic conditions suitable for maize production, the policy of co-operation, freight facilities, storage facilities, additional uses of the maize crop, and steam cultivation in connection with maize production.

If in aiming to prove of interest to the general public both here and in Europe, "Maize Cultivation and Export" has perhaps sacrificed some of its particular value to South African farmers, yet a perusal of its pages will at least serve to emphasise what vast possibilities are offered by the opening up of the European markets. The watchword is "Produce! Produce!" and at the present stage of farming development, and given a definite end in view, when the said article is produced in excess to local requirements, no better motto could have been chosen.

H.G.M.

RHODESIA.—THE O.R.C. DELEGATES REPORT, 1st DECEMBER, 1909.

It cannot but be gratifying to everyone who has made a home in Rhodesia to read the views of representative farmers sent on a special mission to see not only for themselves but for a number of others what are the farming prospects of this country, and to find that guarded and critical as they necessarily must be in such circumstances yet the whole tenour of their report and their final conclusions are emphatically in favour of Rhodesia.

The report, which has been printed and widely circulated, deals with climatic conditions, the soil, the veld, timber, cattle and small stock, diseases, crops, labour, markets, communications, and other social, economic and industrial matters in a practical way, and though there is much that every Rhodesian knows, there are useful criticism and instructive remarks put forward.

Thus the writers find that "The failure of the policy of using bulls of various European breeds in the one herd has been efficiently demonstrated in Southern Rhodesia." Again "The co-operation amongst the Rhodesian farmers is excellent and they are a power in the land." Also "Rhodesia cannot at present (but it may at a later date) be considered a sheep country." "Already expansion of maize growing is taking place, and the export point will soon be reached, unless, as is quite possible, that the local mining industry keeps pace with the maize production." "Rhodesia's greatest want is an agricultural population."

Considering the necessarily hurried nature of the tour of the delegates it is striking how few errors have crept in, one for instance being that "Hail is unknown," which is unfortunately not the case, although it is uncommon.

The report is racily and pleasantly written and should be read with interest by settlers old and new.

E.A.N.

Garden Calendar.

FEBRUARY AND MARCH.

By N. L. KAYE-EDDIE.

FLOWER GARDEN.

During these months the garden should be seen at its perfection and, owing to our rains, requires a great deal of attention in order to keep the soil free from weeds and caking. Drainage should also be looked to in order to avoid plants being swamped or washed away. Dahlias and carnations should now be in their heaviest bloom and will require tying up and the dying blooms should be removed in order to prolong their flowering period. Plants for winter flowering should be now coming on and planted out.

Cuttings of carnations may now be made and should be picked from the choicest plants and taken from stems which have borne the finest blooms. The cuttings should be placed in boxes containing sand and kept in a moist condition in a warm position sheltered from the winds. These should be ready for planting out in about two months and bloom in three. Carnations, verbena, antirrhinum, penstemon, pansy, dianthus, phlox, calliopsis and escholtzia may be sown for early blooming next spring.

VEGETABLE GARDEN.

Tomatoes, peas and beans should be in full bearing, and should be staked and tied. Weeding and cultivationshould be Seeds for late winter crops—beans, cabbage, cauliflower, peas, radish, turnips, spinach, beet and radish should be sown.

Weather Bureau.

RECORDS RECEIVED OF RAINFALL AT STATIONS IN SOUTHERN RHODESIA, 1909.

	November	December
MASHONALAND—		
Brundrett, Mazoe	.28	5.43
Charter (Range)	2.80	5.33
Chilimanzi	2.24	4.78
Chishawasha	1.26	3.98
Enkeldoorn	1.14	3.81
Eagle's Nest	1.30	4.63
Gatooma	1.63	6.95
Gutu	4.34	5.55
Helvetia, Melsetter	3.06	19.67
Inyanga (B.S.A.P.)	2.32	5.91
Inyanga (York Farm)	.13	6.67
Marendella	.71	6.81
Macheke	2.49	4.10
Mt. Darwin	.57	2.06
M'Rewa	1.95	4.45
Melsetter	.91	8.14
Mazoe	.92	4.68
M'toko	...	...
Progress Farm	...	...
Rusapi	1.21	1.62
Salisbury	5.83	4.39
Sinoia	.41	5.07
Summerfield, Penhalanga	1.22	7.33
Sipolio	.40	3.23
Utopia	...	...
Umtali	.89	2.27
Victoria	1.16	...
West Ridge	5.82	4.34
MATABELELAND—		
Bulawayo Observatory	1.56	6.70
Bulawayo (Government House)	1.10	6.46
Belingwe	1.61	7.12
Driefontein	1.00	5.48
Empandeni	2.31	6.48
Filabusi	.70	10.8
Fort Rixon	1.04	8.42
Gwelo	3.24	7.69
Gwanda	.81	6.17
Hope Fountain	2.0	7.74
Inyati	1.50	4.31
Matopo Mission	2.72	5.89
Mshabetsi Mission	1.26	3.95
Nyama Ndhlovu	...	...
Plumtree	1.26	...
Que Que	1.56	5.00
Ringstead Reef	1.06	...
Rhodes Matopo Park	...	7.25
Selukwe	1.69	7.76
Syringa	.98	6.55
Tegwani	...	4.56
Tuli	.68	4.17
Umgusa	1.28	9.63
Victoria Falls	...	5.71

Temperatures Recorded, 1909

(MEANS).

	November.		December.	
	Max.	Min.	Max.	Min.
Bulawayo	82.6	61.3	82.6	61.7
Chishawasha	83.6	56.2	84.5	58.9
Empandeni	86.4	59.3	85.2	62.9
Gwelo	86.7	56.7	81.2	60.6
Hope Fountain	82.8	58.1	84.11	62.15
Melsetter	77.6	...	79.5	...
Plumtree	81.0	61.0	...	...
Salisbury	81.9	57.5	80.8	59.8
Umtali	83.9	41.4	87.9	45.3
Belingwe	83.6	61.7	83.5	63.3
Gwanda	86.9	62.3	88.3	65.2
Rhodes Matopo Park	...	...	83.2	62.3
Tuli	91.6	...	93.3	...
Victoria	83.2	60.0	...	...
Inyanga (York Farm	73.9	52.3	76.1	54.8
Victoria Falls			87.9	65.8

Cookery for the Country.

By L.C.

BARBECUE OF BULLY BEEF.

Mix a tablespoonful of good olive oil with a tablespoonful of vinegar (a dash of tarragon vinegar with ordinary vinegar is an improvement), add a little onion juice or very finely chopped onion, and some pepper and salt, and lay thin slices of bully beef in the mixture (about 1lb. beef). Put in a lined saucepan 3 tablespoonfuls of butter, and when melted add 3 tablespoonfuls of tomato catsup and 3 tablespoonfuls of sherry; lastly, add the slices of beef, taking care as far as possible not to break them, and baste them with the hot wine, etc., until they are thoroughly heated through.

SAVOURY MUTTON.

Slice a 2lb. tin of mutton into a saucepan with barely

enough water to cover; add 4 onions cut in slices (previously parboiled), a good sprinkling of salt and cayenne pepper, and ¼oz. each of ginger and cloves. Stew the whole for 20 minutes, then remove the meat for a while. Mix smoothly together 1 tablespoonful of sugar, 2 tablespoonfuls of lime-juice, and one dessert spoonful of curry powder, and add to the gravy in the saucepan. Let the whole boil up, stirring all the time, then put back the meat, gently simmer for 10 minutes or until the meat is thoroughly warm again, and serve with fingers of dry toast round the dish.

A NICE WAY OF DOING UP COLD MEAT AND POTATOES.

Pass the meat through a mincer, mix with a little gravy or sauce, add salt and pepper to taste, and form into a loaf. Mash the potatoes up, mix with them a little cream or milk, salt and pepper, and melted butter, and spread over the meat loaf, brush over with beaten yolk of egg, and brown in a hot oven. Then slip on to a hot dish with a broad-bladed knife, and serve garnished with slices of lemon.

STEWED KIDNEYS.

Remove the fat and white centre, and soak for an hour in salted water. Cut in slices half an inch thick, cover each slice with flour, and fry for five minutes in butter. Then add to the frying pan one thin slice of onion and one half cupful of boiling water, and simmer gently for ten minutes. Dish the slices on a hot dish, add to the sauce a quarter cup of sherry and some salt and pepper (or, if preferred, a table-spoonful of Worcester sauce instead of the sherry), and pour over the slices. Tinned kidneys may be used for this, but are not quite so good.

Agricultural Reports.

OCTOBER—NOVEMBER, 1909.

MATABELELAND.—Year after year towards the end of the dry season cattle are reported to be suffering from poverty, often dying. The obvious remedies—feasible, cheap and eminently practicable—consist in making hay, preparing silage, the growing of winter crops and grasses, the erection of shelters and provision of water not far remote from the grazing ground, and precautions against grass fires. The prevention of loss by death and the mainfenance of health and condition of the cattle, without the annual enfeeblement and consequent check for which there is no occasion, would soon cover the cost of such precautions. In countries where snow covers the ground for some months of the year, provision has to be made, and it is almost a pity that no similar natural compulsion exists here, for the fact remains that in spite of neglect the great majority of cattle struggle through, and on this many a man depends, excusing himself, saying that he is "ranching."

Lions and other vermin have been more than usually destructive to stock of late. Rainfall has been very partial and, while some farms have ample, others are hard up and are likely to have diminished crops unless a change soon comes. Early rains fell in Belingwe, Matopos and Umzingwani, elsewhere the rains were deficient. In November improvement in the veld took place in Bubi, but the country was very dry in Bulalima-Mangwe, Gwanda and Gwelo, and replanting became necessary in Insiza and Matopos where also the dry heat withered the young grass. Stock suffered somewhat though not very seriously.

MASHONALAND.—The early rains were much wanted when they fell in October and stock generally is doing well, although scab in sheep and goats is occasionally reported. Planting has generally been retarded for want of adequate rain and replanting has been necessary to some extent in Charter, Goromonzi and Mazoe. The rains have been specially late along the Eastern border where at one time the outlook was grave, but fortunately sowing has ultimately been carried out in good season. Ticks are reported as more prevalent this season than hitherto. Dipping tanks are in course of construction on a number of farms, twelve or more,

and no doubt this wise precaution will be adopted more generally ere long. One farmer in Hartley lost 17 sheep in one night, killed by leopards, while lions are also very bold in that district. A somewhat unusual complaint comes from Gutus where hyaenas—popularly "wolves"—have been causing trouble, and during the last few weeks have accounted for about 70 head of stock, small and large.

There can be no question that but for the supply of farm labour from Nyasaland, farming, both in Mashonaland and Matabeleland would have been in a serious predicament, local labour being virtually unobtainable. At the same time the demand for labour is constantly increasing.

Throughout the territory locusts, although occasionally seen in flying swarms, have done no great damage, and voetgangers have not yet been reported.

There appears to be an ample store of food in the country and no scarcity amongst natives anywhere, and in some districts grain is plentiful at low prices.

Veterinary Report for the Months of November and December, 1909

SALISBURY.

No contagious disease.

MARANDELLA.

AFRICAN COAST FEVER.—Existing outbreak: No deaths.

Fresh outbreaks: A fresh outbreak involving 155 head of cattle occurred on the farm Progress, about five miles from Marandella Station. It was decided to destroy the whole of this herd and also all cattle remaining in the infected areas.

In December the disease reappeared amongst a lot of cattle in a temperature camp on the farm Lottie, also amongst a small herd of cattle which was being moved outward from the Springvale centre. All the cattle concerned were destroyed, the work being completed on 24th December. The owners were compensated to the extent of half the value of healthy animals destroyed.

One lot of cattle remains on Rusawi Outspan, close to the infected area. These are under daily observation and will be dealt with when the fence is completed.

BULAWAYO.

SCAB.—One outbreak.

CALF DISEASE.—This has appeared again and a few owners have reported to this Department. In one case in particular the treatment recommended has up to the present been a marked success.

GLANDERS.—The following animals were tested on arrival and found healthy:—

Horses	60
Mules	100
Donkeys	103
	263

UMTALI.

AFRICAN COAST FEVER.—Fresh outbreaks: None.
Existing Outbreaks: No deaths.
SCAB.—Five flocks rem£in under licence.

MAZOE.

RABIES.—A European and dog were bitten by a suspected wild animal in the dark. The dog was placed under observation and died showing symptoms of dumb Rabies which was confirmed by inoculation of rabbits.

M'REWA.

RABIES.—One case occurred. Dog destroyed.

M'TOKO.

RABIES.—One case. Dog destroyed.

VICTORIA.

RABIES.—One case.

MELSETTER.

SCAB.—One outbreak reported.

No disease is reported from Selukwe, Enkeldoorn, Hartley, Insiza, Mazoe, Lomagundi, Darwin, Gwanda, Chibi, Chilimanzi, Sebungwe, Bulalema-Mangwa.

J. M. SINCLAIR,
Chief Veterinary Surgeon.

Market Reports.

London market reports shew that the prices for cereals are unchanged and remain firm.

The local market is well supplied with all articles, especially mealies, rapoko and potatoes, the prices of which in Mashonaland are anticipated to remain about the same during the season.

The following are the latest market quotations received :—

(1) Jas. Lawrence & Co. (Transvaal), Ltd., 12th January, 1910 :—

Barley, per 150 lbs. ...	11/6	13/6
Beans, per 200 lbs. ...	11/6	37/0
Bran, per 100 lbs. ...	6/5	7/0
Chaff, per 100 lbs. ...	2/6	3/6
Forage (T'vaal), 100 lbs.	3/9	5/9
„ (O.R.C.) „	3/6	5/6
„ (Colonial) „	6/0	6/3
Hay, per bale	9d	1/0
Kaffir Corn, White, per 200 lbs.	6/6	6/9
do. Mixed	6/10	7/3
Lucerne, per 100 lbs. ...	4/9	5/3
Mealies, (S.A.), White, per 200 lbs.	7/3	8/0
Mealies, (S.A.), Yellow, per 200 lbs.	8/10	9/3
Oats, per 150 lbs. ...	8/6	11/6
Onions, per 120 lbs. ...	4/6	11/9
Peas, per 200 lbs. ...	8/6	10/6
Potatoes, per 150 lbs. ...	5/0	14/0
Rye, per 200 lbs.	13/3	15/9
Salt, per 200 lbs.	4/8	5/0
Boer Meal, sifted, per 200 lbs.	24/6	27/6
Wheat, per 200 lbs. ...	19/6	21/6
Butter, per lb.	6d	1/1
Eggs, per dozen	1/1	1/4
Ducks, each	1/11	2/6
Fowls, each	1/2	2/6
Geese, each	4/0	5/3
Turkeys	4/6	13/0
Pigeons, each	7d	9d
Slaughter Oxen	£9 to	£13
Sheep, per lb., dressed weight	4d	4¼d
Pigs, per lb.	2½d	3¾d

(2) Jas. Lawrence & Co., Ltd. Kimberley, 14th January, 1910 :—

Bran, per bag 100 lbs ...	6/6	6/9
Barley, per bag 163 lbs ...	8/6	11/6
Beans, Sugar, bag 203 lbs	28/6	30/6
Beans, Kafir, 203 lbs ...	9/6	10/6
Chaff, Colonial, bale ...	6/6	9/6
Chaff, Colonial, pressed, 100 lbs	3/0	3/6
Forage, good, per 100 lbs	5/3	5/9
Kafir Corn, S.A., mixed	6/6	7/0
Kafir Corn, White ...	6/6	7/0
Boer Meal, Colonial, unsifted	26/6	27/6
Boer Meal, Colonial, sifted	28/6	30/6
Flour, Colonial, per bag 100 lbs	16/0	16/6
Yellow Mealies, Colonial, 203 lbs.	9/0	9/6
White Mealies, Colonial, hard, 203 lbs	8/6	9/3
White Mealie Meal, 183 lbs	9/6	10/6
Oats, per bag 150 lbs ...	9/0	10/6
Lucerne Hay, per 100 lbs	4/6	5/0
Onions, per bag 120 lbs...	6/0	9/6
Potatoes, new	5/0	16/0
Tobacco, good, per lb ...	4d	7d
Tobacco, inferior, per lb	1d	2d
Wheat, per bag 203 lbs ...	20/0	22/6
Butter, fresh, per lb ...	8d	10d
Butter, second quality ...	5d	7d
Eggs, per dozen	8d	1/0
Ducks, each	2/6	3/0
Fowls, each	1/3	1/6
Turkeys, each	4/0	9/0
Salt, per bag	3/0	4/0
Dried Peaches, per lb. ...	2d	4d
Dried Apricots, per lb. ...	2d	4d
Lime, per bag	2/6	3/6
Apricots, per box ...	0/6	1/6
Apricots, per basket ...	3/0	6/6
Pineapples, per dozen ...	0/6	1/0
Grapes, per box	2/0	4/0
Plums, per box	0/6	1/6
Plums, per crate	2/0	4/0
Plums, per basket ...	3/0	5/0
Peaches, per box... ...	1/0	1/9
Peaches, per basket ...	3/0	8/6
Spon-specs, per dozen ...	3/0	8/6
Water Melons, per doz...	6/0	25/0
Beans, green, per lot ...	4d	6d
Peas	4d	6d
Cabbages, per dozen ...	3/0	6/6

LIVESTOCK.

Oxen, good, prime, 600 lbs upwards	£6/10	£9
Cows, good, 450 lbs upwards	£4/10	£6
Calves, per lb dead weight		4d
Pigs, 100 lbs (clean), per lb live weight	3d	3¼d
Lambs, 30 lb	6/6	8/6
Hamels, 40 lb to 45 lb ...	8/0	12/0
Cape Sheep, good ...	10/0	12/6
Kapaters, good	10/0	12/6
Oxen, Trex	£5	£6/10
Riding Horses	£10	£25
Draught Horses	£10	£22/10
Mares	£9	£20

(3) Hubert Morisse & Co., Johannesburg, 13th January, 1910:—

Barley, per 163 lbs ...	10/6	13/6
Bran, per 100 lbs, Colonial	6/9	7/1
Chaff, best, 100 lbs ...	2/6	4/6
Eggs, per doz, Colonial...	1/2	1/3
Salt, per bag	4/10	5/0
Forage, Transvaal 100lbs	5/0	5/9
„ Colonial, 100lbs ...	6/0	6/3
„ med. & inferior „	3/6	4/9
S. Meal, best fine, 203lbs	25/6	27/0
Rye...	15/6	15/9
Wheat	19/0	21/6
Mealies, Hickory King	7/9	8/2
Mealies, O.R.C. Whites...	7/0	7/3
Mealies, Yellow	8/9	9/0
Kafir Corn, per 203 lbs ...	6/6	7/1
Hay, Sweet, Transvaal...	9d	1/0
Lucerne, per 100 lbs ...	4/0	5/3
Manna ... „ ...	2/0	3/0
Transvaal Hay, bale ...	6d	10d
Oats, per 153 lbs... ...	9/6	12/9
Potatoes, best, per 153 lbs	12/0	14/6
„ med. and inferior	5/0	11/6
Onions, Cape, 120 lbs ...	9/6	10/6
Turkeys, Cocks	8/0	12/0
„ Hens	3/9	5/3
Fowls	1/3	2/8
Ducks	1/9	2/9
Geese	4/6	5/6
Pigeons	8d	9d
Butter, O.R.C.	11d	1/3
Pumpkins, each	2d	4d
Beans, per 203 lbs, Sound	13/6	39/0

LIVESTOCK.

Slaughter Oxen	£9	£13/10
Slaughter Cows	£7	£8/10
Beef, per 100lbs, prime ...	£1/15	£1/17/6
Milch Cows, Cape ...	£19	£30
Trek Oxen	£7/10	£8/15
Tollies	£4	£5
Sheep, Cape and Bastard, lb	4d	4¼d
„ „ ...	15/0	18/6
Sheep, Merino, per lb ...	4d	4¼d
„	16/0	19/6
Slaughter Ewes	9/6	15/0
Lambs	8/0	12/0
Goats, Boer Kapaters ...	12/6	17/6
Pigs, live weight	2½d	3½d
Mules, large	£18	£22/10
Mules, medium	£15	£16/10
Mules, small	£13	£14/10
Horses, good	£16	£20
Horses, ponies	£11	£13
Donkeys	£5/10	£7
Heifers, 12 to 18 months	£5	£6
Heifers, 2 to 3 years ...	£6	£7/10
Cows, breeding	£7	£8/10

(4) Whitfield & Co., Salisbury, 20th January, 1910.—

Cows, good milkers ...	£25	£35
Cows, Native	£9	£10
Heifers, Colonial	£7	£8
Heifers, Native	£5	£6
Trained Oxen, large ...	£12/10	£14
Trained Oxen, ordinary ...		£10
Mules, inoculated	£25	£30
Mules, not inoculated ...	£20	£25
Horses	£25	£30
Donkeys, Colonial... ...	£6	£7/10
Donkeys, G.E. African ...	£5	£6
Sheep, Colonial		25/-

(5) Wightman & Co., Ltd., Salisbury, 20th Jany., 1910:—

Mealies, per 200 lbs ...	11/6	12/6
Rapoko, per 200 lbs ...	10/6	11/0
Oat Forage, per 100 lbs...	8/0	9/0
Onions, per lb	2d	2½d
Potatoes, per lb	1d	1½d
Munga, per 200lbs ...	10/0	12/0
Salt	19/0	20/0
Boer Meal, sifted, per 200 lbs...	45/0	47/6
do. unsifted	44/0	45/6

Editorial Notices.

The "Journal" is issued bi-monthly, and the subscription is 5s. per annum, payable in advance. All communications relating thereto should be addressed to the Director of Agriculture, Agricultural Department, Salisbury, and if an answer is required in the pages of the "Journal," should reach this office not later than the 15th of the month preceding publication. Subscribers are requested to notify immediately the non-delivery of the "Journal."

TO ADVERTISERS.—Application for space in the "Rhodesian Agricultural Journal," should be addressed to the Director of Agriculture, Salisbury. The rates are as follows, per issue :—

Position.	Whole Page. £ s. d.	Half Page. £ s. d.	Quarter Page. £ s. d.
Inner Pages	2 0 0	1 5 0	0 15 0
Outer Cover (back) ...	4 0 0	—	—
Inner Covers (back and front) and page facing Contents	3 0 0	1 15 0	1 0 0

A discount of 10 per cent. will be allowed for standing or consecutive advertisements running through six issues. Remittances, and electros where desired, should accompany orders. The right is reserved to discontinue the insertion of standing or consecutive advertisements should payment beyond the second issue be delayed.

The right of approval of all advertisements by the Director of Agriculture is reserved and his decision as to the acceptance or rejection is final.

An additional charge may be made for advertisements printed in special type, equal to any additional charges made by the printers for setting up same.

Advertisements will be accepted from bona fide farmers wishing to effect sale, purchase or exchange of produce, live stock, or farm implements, at a minimum charge of 2s. 6d. per insertion of 20 words. Extra words will be charged for at the rate of 1s. for every 10 words.

Correspondence.

THE COST OF AGRICULTURAL OPERATIONS IN SOUTHERN RHODESIA.

TO THE EDITOR, RHODESIAN AGRICULTURAL JOURNAL.

In working out the "cost per diem" Mr. Mundy, in his recent article on this subject, has evidently divided the interest plus depreciation by 336 as being the number of days in twelve months of 28 working days each. Is he not wrong in using this divisor? Should not a "year" be that period per annum during which an implement is actually in use, and gaining its interest and depreciation? I hardly think a "planter," for instance, will be in use 336 days in a year, but would rather put its services at a tenth of the estimate shown; therefore the cost would be:—5 per cent. (interest) plus 25 per cent. (depreciation) equals 30 per cent. of £15 prime cost of planter, equals £4 5s. 0d., divided by say 30 days eqals 2s. 10d. per diem instead of Mr. Mundy's 3d., a very considerable difference.

I am not a farmer and so cannot furnish figures to replace those so ably put forth in the article under review, but perhaps Mr. Mundy would furnish another estimate in which the basis is the approximate actual time an implement (or animal) is working, divided into the amount agreed upon for interest and depreciation in order to get the "cost per diem," and in justice to farmers, it might be well to publish it otherwise some people may think farmers are making a bigger profit than really is the case.

CHIRUPULU.

ANSWER.

The point raised is a difficult one to settle and is acknowledged to be very open to criticism. In all such calculations interest and depreciation present perhaps the most difficult items to accurately and fairly adjudge. What is fair depreciation of an instrument in one man's hands may be anything but adequate when used by another who does not give the instruments proper attention or who is amateurish in using them. Similarly with interest, one farmer may use his

machines for one purpose alone, *e.g.*, a mealie planter for planting his maize crops, while another will find use for it with other crops as well.

It is impossible to draw any hard and fast rule as to the number of days an implement is in use, since this depends on the energy of the farmer and the scale of operations on which he is working.

These remarks can be applied to all farm machinery, and for this reason it seemed better to take a common factor of 336 days which could be applied alike to all items and which individuals could adapt according to their own way of thinking. Adopting "Chirupula's" suggestions the cost has been estimated under conditions similar in all respects except that the number of working days have been estimated as follows :—

Oxen, mules and wagon, 224 days per annum ;
Plough, harrows (zig-zag and disc), weeder, horse hoe, and planter, 36 days per annum ;
Roller, 112 days per annum ;
Winnowers, 36 days per annum ;
Sheller, 56 days per annum.

The difference in total cost is not so great as one might expect, but the cost of production per bag is raised to 5s. as against the original estimate of 3s. 11d. per bag. Add to this, average railway freight to market plus rent of land—the two together certainly not less than 1s.—and the total cost reaches 6s. a bag. Few farmers, I think, would claim that this represents the cost of producing a bag of maize.

A further point which arises is that if implements, etc., are charged according to the number of days they are in use, it might fairly be said that rent of land should be reckoned in the same way ; that is to say, the rent should be calculated on the basis of the number of days the crop occupies the land, and moreover a greater percentage of rent should be charged against arable land than against that portion of the farm uncultivated.

At the present time it would be almost impossible to approach an average estimate if all these considerations were taken into account. H.G.M.

With reference to these remarks it may be pointed out that whether an implement is in use or idle, interest on its capital value has to be calculated for each day of its existence, and further, that animals after a certain age depreciate in value from day to day regardless of work, while implements also deteriorate although not in use, especially when exposed to heat and cold, the sun and rain, as is frequently the case. As the implement is used for one step in a process of production which is performed only once a year, surely interest per annum is a fair charge.

[ED., R.A.J.]

MEALIE CULTIVATORS AND MEALIE HARVESTERS.

The following enquiry has been received from a correspondent:—

I should be glad if you or any of your readers could give me information regarding two-rowed cultivators and mealie stalk cutters.

As regards the first, can they be used with ox traction after planting with oxen and the resultant somewhat wavy lines?

As regards the second, what is the cost? Can they be drawn sufficiently rapidly by oxen, and if so, by how many? Are they made to cut more than one row at a time? I want to clear my lands of stalks to allow of autumn ploughing and prevent their being trampled by cattle. Further, the ordinary method of feeding the stalks in the lands appears very wasteful, taking into consideration the value of the stalks as feed and as litter in the kraal for manure. Moreover, a good deal of labour is entailed in gathering the remainder before ploughing so that they may be destroyed by fire.

I have seen lands reaped and shocked by hand, but this was where a temporary and exceptionally large supply of native labour was available, and even at that was very expensive, and I do not think the farmer in question would care to repeat the experiment.

ANSWER.

Two-row cultivators are not at present in very general use in Southern Rhodesia. Those farmers who are using them appear mostly to work with mules. On the other hand it is a fairly common practice to work two single-row cultivators, with two oxen in one yoke and one leader, thus saving one

boy's labour. If this can be done with two single-row cultivators there seems no reason why the same should not apply to double-row implements until the mealies reach a certain height. One ox walks on either side of the row of plants, and if oxen are accustomed to work in single cultivators and are steady, they should keep the line quite well enough.

MAIZE STALK CUTTER OR HARVESTER.

I have not yet heard of one of these machines being in work in Southern Rhodesia, though one such machine is stocked by a Salisbury firm—the price is about £65. It is fitted with extra high horse gear with the idea of being suitable for working with oxen. The implement is intended to be drawn by three horses, and three strong mules should pull it well, but hardly all day without a change of spans. Harvesters usually cut one row at a time, and the machine in question ties and delivers the stalks in bundles as with a reaper and binder.

A simple cutter which can be used with very good results is made by fixing a scythe blade to a small sledge. This can be drawn along the rows by one or two oxen and does quite good work. If necessary the sledge can be weighted to give greater cutting power.—H.G.M.

The practice suggested by our correspondent is strongly to be recommended. This may be done either before or after the crop is harvested. By cutting off the stalks not only is it possible to plough over the land before it becomes hard and dry, but by removing the stalks and burying the stumps the danger of the mealie grub hybernating on the field is very materially diminished while the stalks can more readily be fed to stock from the stack. — The experience and views of other farmers on this subject are invited.—Ed. R.A.J.

A RECORD POTATOE.

THE EDITOR RHODESIAN AGRICULTURAL JOURNAL.

Dear Sir,—Whilst digging up a small plot of "Up-to-date" potatoes, one plant pave a yield of 105 potatoes, about 25 of which were very small.

I should like to know if this is near a record, or whether any of your subscribers have experienced a greater yield.

Yours truly,

FRED E. WIENHOLT.

[Surely this has not been beaten, at any rate in Rhodesia—Ed. R.A.J.]

GROUND NUTS.

THE EDITOR RHODESIAN AGRICULTURAL JOURNAL.

Dear Sir,—It was with much interest and instruction I perused Mr. Godfrey Mundy's illuminating article on the Ground Nut in the December JOURNAL. He omitted however to refer to "Pests." My experience in an experimental three-acre patch (no cow except when my neighbour's broke in!) was that the hares prefer the Monkey Nut to everything. I had every vegetable growing that is quoted by South African, English and American seedsmen. So much was this the case that I determined to always plant Monkey Nuts as a protection to other crops, but eventually found that the Soy Bean was even more attractive. I found that the plants suffered from leaf rust.

Mr. Richardson, of the Central Estates, who very kindly gave me, an entire stranger, much valuable information as regards this crop, found that Virginian seed was not hardy and therefore crossed it with the local nut, I believe with satisfactory results. I planted imported Virginian seed in alternate rows with the indigenous nut, and the latter was certainly hardier and a heavier cropper.

As regards yield, if the average in Rhodesia is going to be similar to that of the U.S.A., viz, 17.30 bushels—say 23 bushels of 22lbs = @ 80lbs @ 5s. bag, 31s. 3d. per acre, the crop would not appaer to be very interesting except as a rotation ; though, of course, the value of the fodder must be taken into consideration.

It would be interesting if Mr. Richardson and others who have grown this crop on a commercial scale would give us their experience as to the best strain of seed, soils, and time to sow, yield per acre, pests, kraal or commercial manures, and cost of growing. If grown on granitic soils whether maize followed and with what result.

FERN SPRUIT.

[Our valued correspondent would probably find that if he grew larger acerages the damage by game would become infinitesimal. He would no doubt agree that it is always the small patches and experimental plots that get eaten. Regarding prices, he bases his figures at three farthings a pound, whereas the present rate is 1½d. to 2d., and close on the latter sum, even in large quantities, for oil extraction ; while 23 bushels is surely a light crop. As suggested, we will be glad of the views of growers.—Ed. R.A.J.]

Departmental Notices.

THE ANALYSIS OF AGRICULTURAL PRODUCTS, SOILS, WATER, ETC.

SCALE OF CHARGES.

Arrangements have now been made for the chemical examination of soils, grain, and other produce, oil-seeds milk, water, fertilisers, etc., on behalf of farmers and others by the Chemist attached to the Department of Agriculture. The charges made, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

SCHEDULE OF CHARGES.

	£	s.	d.
1. Partial analysis of a manure or feeding stuff, for each constituent...	0	5	0
2. Complete analysis and valuation of a manure or feeding stuff	1	0	0
3. Analysis of Agricultural products, e.g., grain, hay, roots, etc.	1	0	0
4. Analysis of water for Agricultural purposes irrigation or drainage	1	5	0
5. Partial analysis of soil to determine fertility and recommendations as to manurial treatment	2	0	0
6. Complete analysis of a soil	3	0	0
7. Milk—determination of total fat and solids ...	0	5	0
do. do. of fat only	0	2	6
do. complete analysis	0	10	0
8. Cream—determination of fat only ...	0	2	6
do. complete analysis	0	10	0
9. Analysis of Cheese	0	10	0
10. Limestone—Estimation of % of Lime ...	0	5	0
do. complete analysis	1	0	0

Remittances should accompany samples submitted.

No charge will be made where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

DIRECTIONS FOR TAKING SAMPLES OF SOILS.

It is recommended to select four or five spots at least, per acre: taking care that these represent as far as possible the general character of the soil of the field. If the soil of the area to be reported upon presents notable differences the samples gathered from the different parts must be kept separate.

Having selected a proper spot, pull up the plants growing upon it and remove surface accumulations of decaying leaves, etc, if any. Dig a hole about twelve inches deep and trim one side so as to be smooth and vertical; from the side so prepared remove with the aid of a sharp spade a slice of uniform thickness—about three or four inches—down to a depth of nine inches. Place the slice on a clean board or cloth and mix thoroughly with similar slices obtained in the same way from other parts of the field area. About six pounds of the mixture are then placed in a clean cloth bag or wooden box. Forward with the sample the following particulars:—

Date of collection, exact location, position (hillside, vlei or flat), peculiarities of soil or sub-soil, behaviour in wet and dry seasons, crops borne, previous manurial treatment, and every circumstance in fact which will throw light on its agricultural qualities.

DIRECTIONS FOR TAKING SAMPLES OF GRAINS, PRODUCE AND FEEDING STUFFS.

Grains, meal and feeding stuffs and all agricultural produce should be sampled in the same manner as prescribed for fertilizers.

When the feeding stuff is in the state of cake, select not less than three cakes where the quantity does not exceed one ton, not less than five cakes when the quantity does not exceed five tons, and not less than ten cakes when the quantity exceeds five tons.

Break the selected cakes into small pieces, mix them together, and take the sample—not less than one pound—from the mixture.

DIRECTIONS FOR TAKING SAMPLES OF FERTILISERS.

If delivered in bags, select not less than two bags when the quantity does not exceed one ton, and one additional bag for every additional ton.

In no case need more than ten bags be selected.

Empty the selected bags separately on to a clean wooden or stone floor. Thoroughly mix the contents, and set aside one spadeful from each bag, mix together the separate spadefuls and from the mixture take about one pound as a sample.

If the fertiliser is in bulk, mix together portions taken from the different parts, and draw the sample from the mixture.

DIRECTIONS FOR TAKING SAMPLES OF WATER.

All samples should be sent in glass bottles. Stoneware jars are to be avoided. The bottles should preferably be provided with glass stoppers; if corks are used, they must be new and well washed previously in pure water.

In sampling a stream or tank, before taking the samples rinse out the bottle several times with water, taking care to avoid the introduction of mud or sediment.

Before taking a sample of water from a pipe, allow the water to run through it for a few minutes at full pressure.

In all cases, before the sample is taken, always rinse out the bottle several times with the water to be sampled.

Quantity to be taken: 1 gallon.

DIRECTIONS FOR TAKING SAMPLES OF MILK AND CREAM FOR BUTTER-FAT DETERMINATIONS.

The bulk from which the sample is to be drawn should be first poured two or three times from one vessel to another, and about half-a-pint forwarded for examination.

If it is impossible to deliver the sample in a fresh condition, introduce into each sample bottle about as much of the following preservatives as can be held upon a threepenny piece:—Borax, Boric Acid or Salicylic Acid; stating which preservative has been used.

All bottles used must have been previously cleansed with boiling water.

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, etc.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

SAMPLES SENT TO THE DEPARTMENT OF AGRICULTURE.

Parcels are constantly being received for one purpose or another addressed to this Department, very often without any indication of where they come from or why they are sent, and it is difficult in such cases to trace the sender.

It is earnestly requested that farmers and others will mark distinctly on the packages their names and addresses so as to enable their requirements to be attended to without delay.

CO-OPERATIVE EXPERIMENTS.

The Department of Agriculture has stocked the following seeds for distribution this season under the usual terms of Co-operative Experiments. Farmers anxious to test crops on a small scale before sowing more largely, are invited to send in their applications as soon as possible. The distribution is limited, and not more than three to five sorts can be sent to each applicant. The amount sent to any one farmer will depend on the number of applications received, but in any case, sufficient seed will be forthcoming to give the crops a fair trial.

Seed is issued f.o.r. Salisbury, but farmers are expected to pay railway carriage. When the Agricultural Parcels Post Regulations are applicable this means of forwarding will be used as being cheaper and more rapid. Under these terms the seed is issued, on condition that the farmer co-operating supplies at the end of the season a true report on the result of the experiment on forms supplied for that purpose.

Applications should be addressed to the Agriculturist, and as far as possible, will be dealt with in the order in which they are received. The seeds stocked are as follows :—

LEGUMINOUS CROPS FOR HAY, SILAGE, GREEN MANURE AND PASTURAGE.—Lucerne for irrigated or dry land, Sulla,

Egyptian Clover, Tares or Vetches, Lupines, Sanfoin, Cow-grass Clover, Cowpeas, Velvet Beans.

HAY AND WINTER PASTURE, GRASSES.—Tall Fescue, Burnet, Paspalum, Sheep's Parsley, Rescue Grass, Brome Grass, Teff Grass.

MISCELLANEOUS SEEDS. — Castor Oil, Linseed, Rape, Chicory.

WINTER CEREAL SEED DISTRIBUTION.

As an extention of the work carried out last season, the Department is arranging to stock the following winter cereal crops: Wheat, Oats, Barley, Rye, and it is anticipated that the undermentioned varities will be available for distribution during and after the month of March.

Wheat	Bobs Rust Proof	suitable for moderately good land.
	Gluyas Early	
	Klein Koren	for rich land.
	Swartbaard	likely to succeed on moist soil without irrigation.

Oats	Cape Oats (true Boer haver)	only suitable for rich land
	Algerian Oats	a somewhat later variety and suited to poorer soils.
	Sidonian Oats	Worth trial on moist land without irrigation.
	New Zealand Oats	

Nepal Barley or Barley Wheat.

Chevalier (two-rowed Barley) for malting purposes.

Rye, winter—for sandy soils or on moist land without irrigation, or under irrigation.

Early Rye—for green fodder.

Supplies of seed are limited and applications should therefore be made early to the Agriculturist, Department of Agriculture, Salisbury.

SALE OF PASPALUM GRASS.

Slips of this valuable winter grass, for moist situations, are obtainable on application to the Director of Agriulture, Salisbury, packed in bags and f.o.r. Salisbury Station, at the rate of 5/- per 1,000. Good measure is given and remittance must accompany all orders.

MULBERRY CUTTINGS.

Mulberry Cuttings, f.o.r. Salisbury, 5/- per 100. Apply, Manager Experimental Nursery, Salisbury.

TOBACCO SEED.

All enquiries for tobacco seed should in future be addressed to The Manager, Rhodesia Tobacco Warehouse, at Salisbury or Bulawayo.

TOBACCO SEED BED COVERING.

A large supply of calico for covering tobacco seed is now available. It can be obtained from the Anglo-African Trading Company at Salisbury, Bulawayo and Gwelo. Price 2½d. per square yard.

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seeds of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transactions.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem, leaves, flowers, and where possible fruit. Any particulars regarding the habits of the plant, the parts of it which are supposed to be poisonous, etc., will be welcomed, and in return the Department will supply all available information regarding the plants.

DESTRUCTION OF WILD CARNIVORA, ETC.

It is hereby notified for public information that the rewards for the destruction of wild carnivora, etc., will be paid only on the scale and conditions herein set forth.

2. Rewards will be paid as follows :—

For each Lion	£3	0 0
„ Leopard	1	0 0
„ Cheetah	1	0 0
„ Wild Dog	0	10 0
„ Crocodile, of not less than 3 ft. in length	0	10 0

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, and to natives by the Native Commissioner of the district, within three months of the date upon which the animal is killed, on a prescribed declaration form.

4. In proof of destruction, applicants for rewards will be required to produce and surrender, in the case of the Lion, Leopard or Cheetah, the skin with the tail not severed, and in the case of the Crocodile or Wild Dog, the unskinned head.

5. The skins and heads of animals for which rewards have been paid shall be the property of the Government, and shall be disposed of in such manner as may be decided on.

PURCHASE OF STUD STOCK BY GOVERNMENT ON BEHALF OF FARMERS.

Arrangements have been made whereby farmers may purchase pure bred stud stock through the Department of Agriculture.

Besides securing the benefit of the most competent judges to select the animals, whether in South Africa, England or Europe, purchasers are enabled to make payments by instalments spread over a period of one year.

For full particulars application should be addressed to the Director of Agriculture, Salisbury.

LOANS FOR FENCING.

The B.S.A. Company is prepared to advance funds to any owner of a farm beneficially occupied by a white person, to provide fencing material, on the following conditions :—

1. Half the cost of the material at nearest station or siding will be advanced, in no case exceeding the sum of £150.
2. Payment shall be made in ten equal annual instalments, or less if the applicant desires, together with interest at 5 per cent. per annum, payable in July, but no repayment will be called for within one year of granting the loan.
3. The applicant will be required to pass a first mortgage bond over his farm as security for the loan, *or* to furnish personal security to the satisfaction of the Board.

The loan will be made on completion of fence, and subject to inspection by a representative of the Company. The fence may be erected to any pattern approved by the Board, but for guidance the following minimum requirements will normally be insisted upon :—

Straining posts not farther than 440 yards apart; standards not farther than 60 feet apart; droppers or lacing not farther than four yards apart; if no droppers are used standards should not be more than 20 feet apart. If wooden strainers, standards or droppers are proposed to be used, the kind is to be specified.

Applications stating the situation and mileage, and furnishing specifications of fence proposed to be erected, and accompanied by firm and detailed quotations for the material required and cost at nearest station, must be addressed in the first instance to the Director of Agriculture, Salisbury. Applicants should state whether internal or boundary fences are to be erected.

Preference will be given to farmers in areas which have adopted Part I. of the "Fencing Ordinance, 1904," and to boundary fences, but all applications will be considered.

Farmers are invited to submit applications for the consideration of the Fencing Board to the Director of Agriculture, Salisbury.

Government Notices.

No. 223 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 30th September, 1909.

IT is hereby notified for public information that His Honour the Acting Administrator has been pleased to approve of the temporary appointment of James Woodin, Esquire, to be examiner of Stock for the purpose of granting permits for the introduction of Livestock into Southern Rhodesia.

By command of His Honour the Acting Administrator.

P. D. L. FYNN,
For Treasurer.

No. 211 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 16th September, 1909.

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—

Grass	Straw
Hay	Lucerne Hay
Forage	Green Lucerne
Sugar Cane	

or any other bedding or fodder plant.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,
For Treasurer.

No. 295 of 1908.
Department of Agriculture,
Administrator's Office,
Salisbury, 1st October, 1908.

IMPORTATION OF STOCK.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 8, of the 19th day of January, 1905, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries enumerated is prohibited, owing to the existence or supposed ex-

istenco of destructive diseases affecting the said animals in the said countries:—

(1) All animals from the island of Mauritius.

(2) All animals from German South-West Africa and all animals except donkeys from German East Africa.

(3) Pigs from the colonies of the Cape of Good Hope, Transvaal and the Orange River Colony, the Bechuanaland Protectorate, the Tati Concession, and other countries in which swine fever exists, subject, however, to the exceptions contained in the proviso to this section.

(4) Dogs from the territories of North-Eastern and North-Western Rhodesia and Portuguese East Africa; provided, however, that dogs from countries from which importation is permitted may be introduced through the port of Beira and brought direct into this Territory.

(5) Sheep and goats from (a) the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingswilliamstown, Komgha, Peddie, Somerset East, Stockenstroom, Uitenhage, and Victoria East, in the Cape Colony; (b) the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterburg, and Zoutpansberg, in the Transvaal; (c) Swaziland; (d) Portuguese Territory; (e) places north of the Zambesi River.

Provided, however, that the Controller of Stock may at his discretion permit the importation of pigs under six months of age for breeding purposes from the places mentioned in sub-section (3), and sheep and goats from the places mentioned in sub-section (5) hereof, on production of a certificate of a duly authorised Government veterinary officer that such animals are free from disease, have not been in contact with diseased animals, and have not come from an area where destructive disease has existed for twelve months previously.

2. The importation of organic manures, except guano, is strictly prohibited, and the importation of bone meal and bones required for fertilising or feeding purposes will only be permitted when accompanied by the certificate of a responsible and competent person that they have been thoroughly disinfected by treatment by superheated steam or other approved method. Any such manures, bone meal or bones introduced into Southern Rhodesia contrary to this regulation shall be liable to immediate destruction.

3. The areas set out in Schedule "A," and such further areas as may be added to the said schedule, shall be used in connection with pasture lands of the places to which they relate for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever.

4. The appointment of the areas set out in Schedule "B" hereto for the depasturing and quarantining of animals for slaughter in connection with the places therein mentioned is confirmed.

5. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel and the period for which the permit shall be in force. In cases where it may appear necessary or desirable, the person to whom any such permit is issued may be required to cause the animals

referred to therein to be dipped before being moved.

6. The introduction of sheep and goats against which no prohibition exists may be permitted by rail, subject to the following provisions:—

(1) Plumtree shall be regarded as the port of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto; provided, however, the Controller of Stock may allow the introduction of well-bred sheep or goats intended for sale or stud purposes without being previously dipped.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival; provided, however, that animals intended for immediate slaughter shall be exempt from dipping if marked with a distinctive brand on the back.

7. The introduction of sheep and goats against which no prohibition exists may be permitted by road, subject to the following provisions:—

(1) M'Lala Drift and Fort Tuli shall be regarded as ports of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival.

8. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Officer at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detrained at any intermediate station without the written authority of a Government Veterinary Surgeon.

9. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the police camp nearest to the place where such entry is made, and the officer in charge of such police camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

10. All horses, mules and donkeys upon entering Southern Rhodesia shall be tested with mallein, and the owner or person in charge of such animals shall, in all respects, carry out the lawful directions of the Inspector while such animals are being tested; provided that this regulation shall not apply to animals in transit by railway through Southern Rhodesia and which are not detrained en route.

11. The Inspector may direct the detention of any animal, and its isolation for the purposes of such examinations and tests as may be deemed expedient during which period of isolation or detention it shall be maintained and tended at the expense of the owner. If in the case of any such animal a second injection of mallein, applied at an interval of not less than ten days, is followed by a reaction indicative of the existence of glanders, such animal shall be forthwith destroyed.

12. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border to and from Portuguese East Africa, may be allowed so to cross on such terms as to registration, branding, testing and other conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

13. All horses, mules and donkeys depastured on the town lands of Melsetter and Umtali or on any public outspan adjoining such lands, and within the following area known as the Penhalonga, Imbesa and Samba Valleys, as bounded by the Umtali Waterfall Range on the north, the divide following beacons 18, 24 and 27 on the east, the Christmas Pass Range on the south, and the Palmyran Range on the west, in the district of Umtali, shall be dipped every fourteen days, by or at

the expense of the owner or person in charge of such animals, unless the local Veterinary Officer shall see fit to dispense with such dipping.

14. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings, fodder, excreta or other matter or thing which may be reasonably calculated to convey such infection.

15. Any person contravening the provisions of these regulations, or the instructions or directions given in terms of these regulations, shall be liable in respect of each offence to a penalty not exceeding twenty pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

W. H. MILTON.
Administrator.

By command of His Honour the Administrator.

F. J. NEWTON,
Treasurer.

SCHEDULE "A."

Areas on or near pasture land used in connection with townships set apart for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever:—

1. For the township of Salisbury and its neighbourhood, the Government Farm Makabusi, as defined in Government Notice No. 13 of 1898, namely, about six miles from Salisbury on the Old Charter Road, and bounded on the north, north-east and west by the farm "Willowdale," and on the south and south-east by the Makabusi River.

2. For the township of Umtali, a triangular piece of land situate to the north-east of the township, being that portion of the farm "Birkley" which falls in British territory.

3. For the township of Melsetter, a piece of land included within those lines bounding the pasture lands laid out around the township, which are in common with the outspan in the west, Sawerombi on the north, and Westfield on the north-east, bounded further on the south by a line drawn from the common beacon of Westfield and Lindley to the common beacon of Fairfield and outspan.

4. For the township of Enkeldoorn, a piece of land about 2¼ miles due west of the township and bounded as follows: From a point about 400 yards above the junction of a stream running south of Enkeldoorn township with streams running west from the Police Camp; thence along the first stream to the junction aforementioned; thence along a valley running due south from the said junction to a point about 700 yards distant; thence in a north-westerly direction to a point on the top of a rise about 1,200 yards distant; thence in a straight line to the first-mentioned point.

5. For the township of Victoria, a strip of land half-a-mile in width lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

6. For the township of Gwelo, a triangular piece of ground within the reserved lands around Gwelo. It is bounded south by the Watershed Block along its boundary running from its joint beacon with Kanuck westwards to another beacon 1,518 Cape roods distant, bounded north-westwards by a line about 1,350 roods in length to the Inoculation Station, and bounded north-eastwards by a line from the first mentioned beacon to the Inoculation Station, and about 1,400 roods in length. This piece of ground is called the Inoculation Camp.

7. For the township of Bulawayo that portion of the commonage bounded on the west and north by the Bulawayo-Mafeking and Gwelo railway lines, on the east by the road known as "Hillside Avenue," on the south to the limits of the commonage and Hillside, known as "Napier's Lease," approximately 4,750 acres in extent.

SCHEDULE "B."

Areas set apart for depasturing and quarantining of animals for slaughter:—

SALISBURY.—Description of the area.—A piece of land, 400 acres in extent, situated on the Makabusi River, below Maggio's plot, towards the southern boundary of the Salisbury commonage.

BULAWAYO.—Description of the area.—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi Road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres, more or less.

GWELO.—Description of the area.—Starting from a point where the Ingwenia Road crosses the railway, along this road past the sanitary stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the commonage beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins Main Street extension along this to the railway line, and down this to the starting point.

UMTALI.—Description of the area.—Starting from a point at the south-east corner of the farm "Devonshire" and south-west of "Waterfall," up the stream to where it is joined by the stream commonly known as Rifle-butt Spruit, and up this spruit to a point 300 feet below Paulington Bridge. Thence almost due north on the west of Penhalonga Road to the sanitary pits and from the sanitary pits to the Cemetery, thence due west to the "Devonshire" line and along this line south to south-west corner beacon of "Waterfall."

SELUKWE.—Description of the area.—A piece of fenced land, in extent about 300 acres, situated on the farm "Sebanga" and adjacent to the township of Selukwe.

PENHALONGA.—Description of the area.—A piece of land bounded as follows:—To the northward by a line starting from the south-east beacon of the hotel stand to the south-west and south-east beacons of Crawford's butchery. To the eastward from the south-east beacon of Crawford's butchery to the northern boundary of the Penhalonga Proprietary Mines' ground. To the southward along the northern boundary line of the Pennaionga Proprietary Mines' ground. To the westward from the north-west beacon of the Penhalonga Proprietary Mines' ground to the south-east beacon of the hotel stand.

VICTORIA.—Description of the area.—A strip of land, half-a-mile in width, lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

SCHEDULE "C."

I, ...
residing at
in the district of in the
.....Colony, do solemnly and sincerely declare that the animals enumerated below are free from any contagious disease, including scab, and have not been in contact with any infected animals within six months from date hereof, and that to the best of my knowledge and belief such animals in travelling to* Station will not come in contact with any animals amongst which scab or any other contagious disease has existed during that period; further, that

such animals were thoroughly disinfected by dipping on..... and will enter Southern Rhodesia within ten days of having been dipped.

And I make this solemn declaration conscientiously believing the same to be true.

Declared to at on this day of before me.

.....

Resident Magistrate, Government Veterinary Surgeon, Scab Inspector, or Police Officer of district from which animals are being sent.

Number and general description of animals being sent

.....

Owner's name and Address

.....

Place in Southern Rhodesia to which animals are being sent

.....

* Station within Colony of origin.

CERTIFICATE ISSUED UNDER PROVISIONS OF SECTION 1, GOVERNMENT NOTICE No. 207 OF 1908.

This is to certify that the animals enumerated below are, in my opinion, free from any destructive disease, including scab, and to the best of my knowledge and belief have not been in contact with any infected animals nor come from, or through, a locality where any such disease is known to exist or has existed for twelve months from date hereof.

Date.....

Place.....

.....

Signature of Government Veterinary Surgeon.

Number and general description of animals.....Pigs, ...Sheep, ...Goats.

Place from which animals are to be sent.....

.....

Owner's Name and Address

.....

Place in Southern Rhodesia to which it is desired to send the animals

.....

No. 110 of 1908.

Department of Agriculture,
Administrator's Office,
Salisbury, 16th April, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

(1) A permit shall be required from the Chief Inspector which may

contain such conditions as shall from time to time appear expedient.

(2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."

(3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.

(4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.

(5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcases thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.

(6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—

(1) Importation shall be through and direct from the Coast Ports of the Cape Colonies, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.

(2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.

4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcases, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.
GOVERNMENT NOTICE No. 110 OF 1908, SECTION 1 (2).

1. Applicant's Name and Address.....
2. Number and Class of cattle to be imported.....
3. Area or Farm and District where Cattle are at present located.....
.....
4. Area or Farm and District to which Cattle are to be moved.....
.....

Applicant's Signature.....

Date
Application
Permit No.

No. 60 of 1909.
Department of Agriculture
Administrator's Office,
Salisbury, 1st April, 1909.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal Government Notice No. 124 of 1908, and do hereby declare and make known that, notwithstanding anything to the contrary elsewhere provided, the importation of cattle for bona fide slaughter purposes may be permitted into the Umtali district from the adjoining Portuguese territory, under the following terms and conditions:—

(1) The importation and disposal of cattle, introduced in terms of these regulations, shall be under the absolute control and direction of the local Veterinary Surgeon or other duly appointed officer, and shall be regulated by the requirements of consumption.

(2) The importation shall be by rail only, and all cattle shall be detrucked at the slaughter enclosure and immediately confined therein.

(3) All cattle admitted to the slaughter area shall be immediately branded with the letters "V.D."

(4) All cattle admitted to the slaughter area shall be slaughtered within ten days of their admission, and under no pretext whatever shall cattle so admitted be permitted to leave the said area alive; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.

(5) No meat shall be removed from the said area without special permission unless it is entirely free from skin and ears.

(6) The hides of animals slaughtered in the said enclosure shall be immediately immersed in an approved insecticide for a period of not less than twelve hours, and shall not be removed from the said enclosure unless accompanied by a certificate signed by a Veterinary Surgeon that they have been satisfactorily disinfected and dried.

(7) Any person contravening the provisions of these regulations or the instructions or directions of the local Veterinary Surgeon or other duly authorised official, given in terms of these regulations, shall be liable, in respect of each offence, to a penalty not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, unless where more severe or heavier penalties have, by the aforesaid Ordinance, been expressly provided.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 268 of 1907.
Department of Agriculture,
The Treasury,
Salisbury, 20th December, 1907.

REMOVAL OF CATTLE FOR SALE.

NOTWITHSTANDING anything to the contrary contained in the Regulations published under Government Notices Nos. 188 of 1906 and 217 of 1907, I, under and by virtue of the powers conferred upon me by the "Animals Diseases Consolidation Ordinance, 1901," do hereby provide as follows:—

1. The assembly of cattle for purposes of sale by auction or otherwise may be permitted at such places and under such conditions as the Chief Inspector may from time to time prescribe.

2. The movement of cattle into the province of Mashonaland and the fiscal division of Gwelo from other places in Southern Rhodesia may be permitted under such conditions as the Chief Inspector may from time to time prescribe.

3. The granting of permits for the purposes of Sections 1 and 2 hereof and the nature of the conditions to be attached thereto shall be at the absolute discretion of the Chief Inspector.

4. Any person contravening the provisions of these Regulations or the conditions attached to permits issued thereunder shall be liable to a fine not exceeding £20, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 216 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 23rd September, 1909.

MOVEMENT OF CATTLE, PROVINCE OF MASHONALAND AND DIVISION OF GWELO.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices No. 217 of 1907, Nos. 114 and 170 of 1908 and No. 199 of 1909, and so much of any

other Regulation as may be repugnant to or inconsistent with the provisions of these Regulations, and declare that the following shall be of full force and effect in lieu, from date of publication, within the Province of Mashonaland and the Fiscal Division of Gwelo, as defined by the "Southern Rhodesia Boundary Regulations Amendment Regulations, 1898," which areas are hereby declared to be infected with a destructive disease:—

1. The movement of cattle within the said areas is prohibited save and except—

(*a*) on permission granted by an inspector or sub-inspector or other officer authorised by the Administrator;

(*b*) within the boundaries of any single farm where such cattle are depastured;

(*c*) within any area enclosed by a substantial fence;

(*d*) within the boundaries of the various commonages, town lands or grazing ground common to any mining camp;

(*e*) for cattle the property of natives within a radius of four miles of their owners' kraal situate within the boundaries of any native location or reserve; the site of such kraal shall be deemed to be the place where it is situated at the date of publication hereof, and as is hereinafter further provided.

2. The movement of cattle for *bona fide* farming, breeding, mining, dairying, grazing and slaughter purposes may be permitted under the written authority of an official thereto duly authorised, subject to the following terms and conditions—

(*a*) the written permission of owners, occupiers or managers of all occupied lands, and, in the case of native reserves, of the Native Commissioner of the district over which cattle shall pass, is obtained; provided that, in the event of such owners, occupiers, managers or Native Commisssoners refusing to grant such permission, the Controller of Stock may direct the issue of a permit of removal if satisfied that the necessary permission is withheld without good and sufficient cause; and provided further that such permission shall not be required in respect of any movement of cattle within native districts or group of native districts as defined under Section 3 hereof, or in such districts or group of districts as may hereafter be defined, or in respect of movements authorised in terms of subsection (*c*) of the said Section;

(*b*) that such cattle shall, before being moved, be thoroughly dipped or sprayed to the satisfaction of the officer issuing the permit, and, if intended for slaughter, shall where possible be branded, under the supervision of the officer issuing the permit, with the letters "V.D." on the near hind quarter;

(*c*) that cattle intended for slaughter shall, on arrival at destination subject to the terms of clause (*d*) hereof, be immediately taken to the prescribed quarantine area and there be quarantined and confined, and, where not branded in terms of clause (*b*) hereof, be similarly branded under the supervision of a duly authorised officer;

(*d*) that all cattle intended for slaughter brought to their destination and not dipped or sprayed in terms of clause (*b*) hereof, shall be immediately thoroughly dipped or sprayed;

(*e*) that all cattle admitted to the quarantine area shall be slaughtered within twenty-one days of admission, and only be permitted to leave the area for the purpose of being driven to the abattoir for slaughter;

and all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found outside the said area, at large or in possession of any person may be destroyed under an order of the Chief Inspector or Controller of Stock;

(*f*) that intermediate depots, or concentration camps, for slaughter stock may be allowed at centres approved of by the Chief Inspector of Cattle, provided that no such camp shall be situated within a less radius than five miles of any commonage, town lands, or grazing ground common to any mining camp, railway station or siding.

3, The movement of working cattle may be permitted under the written authority of an official thereto duly authorised—

(*a*) within the borders of the following native districts:—Gwelo, Hartley, Lomagundi, Marandellas, Melsetter, Selukwe and Umtali;

(*b*) within the following groups of native districts:—

(1) Charter and Chilimanzi;
(2) Mtoko, Mrewa, Makoni and Inyanga;
(3) Goromonzi' Mazoe and Darwin;
(4) Chilimanzi, Victoria, Ndanga and Chibi;

(*c*) between the Makondo Copper Mine in the Ndanga district and Karombe's Kraal in the Umtali district along the west bank of the Sabi river;

Provided that all cattle working under this section should be thoroughly dipped or sprayed every fourteen days, and provided that movements will be permitted for such periods as the Controller of Stock may in his discretion and on the advice of the Chief Inspector deem expedient, and that such permission may at any time be withdrawn or withheld without notice.

4. All applications for the removal of cattle from one native district to another shall be submitted for the approval of the Cattle Inspectors of the districts to and through which movements are made. All permits granted under the provisions of these regulations shall specify the number and brands of cattle, route to be traversed and time to be allowed for each journey, and such other conditions as it may be deemed expedient to prescribe; and all such permits shall be in the possession of the person travelling with or in charge of the cattle. Any breach of such conditions shall be deemed a contravention of the regulations in terms of section 9 hereof.

5. All veld-fed animals within the limits of the various commonages or town lands, or other centres where there is a common grazing ground and upon which public dipping tanks have been established, shall be dipped therein at least once every fourteen days; provided that the Controller of Stock may, on the advice of the Chief Inspector, direct the temporary suspension of this regulation for such reasons as he may regard as sufficient.

6. The following charges shall be paid at the time of dipping by the owner of the cattle or other animals required to be dipped under these regulations in respect of any dipping done at the public dipping tank:—

For horned cattle, 6 months and over	3d. per head.
For horses and mules	3d. „
For calves (under 6 months) and donkeys ...	2d. „
For small stock	½d. „

with a minimum charge of 6d. for any number of animals not aggregating such fee under the above tariff.

7. Any permit granted may be summarily suspended by any Inspector or Sub-Inspector or member of a police force finding cattle travelling under the same to be infested with ticks, and such officer may detain such cattle until such time as the animals have been cleansed to his satisfaction.

Any dipping or spraying required to be done under these regulations shall be carried ont with an approved tick-destroying agent by the owner of the animals; provided that the Inspector or Sub-Inspector may at his discretion carry out such treatment at the entire cost of the owner of such animals.

The Controller of Stock may, on the advice of the Chief Inspector, direct the temporary suspension of dipping and spraying for such reasons as he may regard as sufficient.

8. Whenever the owner, occupier or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying or dipping or any other method permitted by these or any other regulations, the Cattle inspector may order such natives or others as have cattle on the same farm to cleanse such cattle or any others before permitting them to enter or pass over such area, and the Native Commissioner of the district in which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle, at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

9. Any person contravening any of the provisions of these regulations shall, upon conviction, be liable, in respect of each offence, to the fines and punishment prescribed by the Ordinance; and, in the case where no special punishment is provided, to a fine not exceeding £20 or, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding three months unless the penalty is sooner paid.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,
For Treasurer.

No. 356 of 1908.

Department of Agriculture,
Administrator's Office,
November, 1908.

MOVEMENT OF CATTLE INTO MATABELELAND.

NOTWITHSTANDING anything to the contrary contained in the Regulations published under Government Notices Nos. 188 of 1906 and 217 of 1907, I, under and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide as follows:—

1. The movement of cattle from the Province of Mashonaland into the Province of Matabeleland and from the Fiscal Division of Gwelo into other parts of Matabeleland may be permitted under such conditions as the Chief Inspector may from time to time prescribe, provided, however, that such movement shall not be permitted in respect of cattle imported from the country to the North of the Zambesi River until they shall have first remained for a period of at least twelve months in the Province of Mashonaland or the Fiscal Division of Gwelo.

2. The granting of permits for the purposes hereof, and the nature of the conditions to be attached thereto, shall be at the absolute discretion of the Chief Inspector.

3. Any person contravening the provisions of these regulations, or the conditions attached to permits issued thereunder, shall be liable to a

fine not exceeding £20, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No 39 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 11th March, 1909.

MOVEMENT OF CATTLE, PROVINCE OF MATABELELAND.

1. UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 188 of 1906 and 216 of 1907, and declare the following to be of full force and effect in lieu thereof within the province of Matabeleland, exclusive of the district of Gwelo, as described and defined by section 4 (c) of the Southern Rhodesian Boundary Regulations Amendment Regulations, 1898, which is hereby declared to be an area infected with a destructive disease, and is hereinafter called the said area.

2. The movement of all cattle within the said area is prohibited save and except

(a) on permission granted by the local Cattle Inspector;
(b) within the boundaries of any single farm where such cattle are depastured;
(c) within an area of land enclosed by a substantial fence;
(d) within a radius of four miles from any native kraal situate within the boundaries of any native location or reserve, and as hereinafter further provided.

3. The movement of cattle for slaughter, grazing, bona fide farming, mining or breeding purposes, or for private milk supplies, shall be permitted under the written authority of an official thereto duly authorised, subject to the following terms and conditions:—

(a) that the written permission of owners, occupiers, or managers of all occupied land, and in the case of native reserves, of the Native Commissioner of the district over which such cattle shall pass, is first obtained; provided that in the event of such owners, occupiers, managers or Native Commissioners refusing to grant permission, the Controller of Stock may direct the issue of a permit of removal, if satisfied that the necessary permission is withheld without good and sufficient cause;
(b) that such cattle shall, before being moved, be thoroughly disinfected by dipping or spraying, to the satisfaction of the officer issuing the permit, and at the expense of the owner of such stock, and, if intended for slaughter, shall where possible be branded, under the supervision of the officer issuing the permit, with the letters "V.D." on the near side of the neck;
(c) that cattle intended for slaughter, shall, on arrival at destination, subject to the terms of clause (d) hereof, be immediately taken to the prescribed quarantine area and there be quarantined and

confined, and, where not branded in terms of clause (b) hereof, be similarly branded under the supervision of a duly authorised officer;

(d) that all cattle intended for slaughter brought to their destination and not disinfected by dipping or spraying, in terms of clause (b) hereof, shall be immediately taken to the public dipping station and there be thoroughly dipped or sprayed before being taken to the quarantine area;

(e) that all cattle admitted to the quarantine area shall be slaughtered within twenty-one days of the admission, and only be permitted to leave the area for the purpose of being driven to the abattoir for slaughter; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area, or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.

4. The movement of working cattle may be permitted under the following conditions only:—

Within the said area from private farms, mines and trading stations to any centre of consumption, or to or from a railway station or siding, or to and from any other farm under the permit of a duly authorised officer, which permit shall fully set forth the route to be traversed; provided that no permit shall be issued until the person applying for the same shall produce the written consent of owners, occupiers or managers of occupied lands proposed to be traversed, and in the case of native reserves, of the Native Commissioners, and that such cattle, before being moved, be thoroughly disinfected by dipping or spraying at the expense of the owner, and to the satisfaction of the officer issuing the permit; provided, further, that in the event of such consent being unreasonably withheld, the Controller of Stock may direct the issue of a permit.

5. All applications for the removal of cattle from one native district to another shall be submitted for the approval of the Government Veterinary Surgeon at Bulawayo and the Cattle Inspector of the district to which the removal is to be made.

6. All permits granted under the provisions of this notice shall specify the number and brands of cattle, route to be traversed, and time allowed for each journey. Any breach of these or other conditions endorsed on the permit by the issuing officer shall be deemed a contravention of these Regulations, in terms of section 9 hereof.

7. All veld-fed animals within the limits of the various commonages or townlands, or other centres where there is a common grazing ground and upon which public dipping tanks have been established, shall be dipped therein at least once every fourteen days; provided that the Controller of Stock may, on the advice of the Veterinary Department, direct the temporary suspension of this Regulation, for such reasons as he may regard as sufficient.

8. The following charges shall be paid at the time of dipping by the owner of the cattle or other animals required to be dipped under these Regulations, in respect of any dipping done at a public dipping tank:—

For Cattle (over six months)	3d.	per head.
,, Horses and Mules	3d.	,,
,, Calves (six months and under)	2d.	,,
,, Small Stock	½d.	,,

with a minimum charge of 6d. for any number of animals not aggregating such fee under tariff.

9. Any disinfecting by spraying required to be done under these Regulations shall be carried out with an approved insecticide by the owner of the animals so sprayed; provided that the Inspector may, at his discretion, carry out such disinfection, with the assistance of and at the entire cost of the owners of the animals sprayed, the cost of such disinfection being payable at the time of the spraying.

10. Any person contravening any of the provisions of these Regulations shall, upon conviction, be liable, in respect of each offence, to the fines and punishments prescribed by the Ordinance; and, in the cases where no special punishment is provided, to a fine not exceeding £20; or, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding three months, unless the penalty be sooner paid.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 101 of 1909.
Department of Agriculture,
Administrator's Office,
Salisury, 19th May, 1909.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the disease amongst live stock, due to the organism known as Trypanosoma Dimorphon, to be a destructive disease within the meaning of the said Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No 45 of 1909.
Administrator's Office,
Salisbury, 13th March, 1909.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 156 and 228, of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the

first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcases of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. In the event of any outbreak of rabies occurring, all owners of dogs within fifteen miles of such outbreak, or such other area as may be fixed, shall, on notification by any of the above-mentioned officials, or by Government Notice in the "Gazette," at once place and keep their dogs in a safe enclosure, or chained up, for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash held by the person exercising them.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the

owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON.
Treasurer.

No. 249 of 1908.
The Treasury,
Salisbury, 27th August, 1908.

PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON.
Treasurer.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

(a) Birds and Small Buck.

(b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tasessibe, Waterbuck and Wildebeest.

(c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—

In Mashonaland:

Birds from 1st May to 30th September.
Small Buck from 1st May to 31st October.

In Matabeleland:

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Secretary for Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Secretary for Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Velt in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 40 of 1909, amended by No. 128 of 1909, withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1910, and transfers from Class "C" to Class "B" Eland, Koodoo, and Zebra so far as that area is concerned. Under Government Notice No. 129 of 1909 game in Class "B" may be shot without a licence in this area.

Game in Class "A" may be hunted in the close season until further notice, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Salisbury, Bulawayo, Umtali and Melsetter; within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the landowner.

No. 128 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 10th June, 1909.

GAME LAW CONSOLIDATION ORDINANCE, 1906.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby declare and make known that the area described in section 1 of Government Notice No. 40 of 1909 shall be extended and include the area bounded as follows:—

From the Railway bridge on the Umfuli River thence north-westwards along the Umfuli River to where it joins the Umniati River, thence south-wards along the Umniati River to where it joins the Umsweswe River, thence eastwards along the Umsweswe River up to the drift at the Lydia Mine, thence along the old road from Lydia Mine to Etna Mine and to Inez Mine, thence northwards along the road from Inez Mine to Hartley, thence in the direction of the Railway bridge to the starting point on the Umfuli River.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council..

P. D. L. FYNN,
For Treasurer.

Ordinance No. 1, 1908.] [Promulgated 18th December, 1908.

SOUTHERN RHODESIA.

AN ORDINANCE TO FURTHER AMEND THE LAW WITH REFERENCE TO THE BRANDING OF STOCK.

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

1. Sections 7, 8, 9, 10 and 13 of "The Brands Ordinance, 1900" (herein after referred to as the said Ordinance), and so much of any other law as is repugnant to or inconsistent with the provisions of this Ordinance are hereby repealed; but such repeal shall not be taken to affect the validity of any brand duly registered at the time of coming into operation of this Ordinance.

2. No person shall have the right of claiming to have any special form or design of brand allotted to him, but any person requiring a brand shall, on application, and on payment of the prescribed fee, have a brand allotted to him by the Registrar.

3. Section 23 of the said Ordinance is hereby amended by the addition of the following sub-section:—

"(6) The system and procedure to be observed by the Registrar in allotting brands."

4. This Ordinance may be cited for all purposes as the "Brands Ordinance Amendment Ordinance, 1908."

Above is the text of the Ordinance passed during the last Session of the Legislative Council, the object of the Ordinance being to so amend the Brands Ordinance, 1900, as to permit of the system of branding known as the "Three piece system."

Following are the regulations promulgated under the Ordinance, and which brought the new system of registration into operation on 7th January, 1909.

No. 391* of 1908.

Department of Agriculture,

Administrator's Office,

Salisbury, 17th December, 1908.

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdrew the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

* Republished with corrections.

9. There shall be payable to the Registrar or Deputy Registrar:—

(a) For every separate registration of a brand, 5s.

(b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next in order, according to the following table:—

i. Off Neck or Rump (or Thigh);

ii. Near Shoulder (or Top of Arm);

iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

i. Off Rump (or Thigh);

ii. Near Shoulder (or Top of Arm);

iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

i. On Near Side or Ribs;

ii. Near Rump (or Thigh);

iii. Off Shoulder;

iv. Off Side or Ribs;

v. Off Rump (or Thigh).

(d) In the case of ostriches:—

i. On Near Thigh;

ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette."

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the provisions of this section shall on conviction be liable to a fine not exceeding £5.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

P. D. L. FYNN,
Acting Treasurer.

SCHEDULE A.

APPLICATION FOR A BRAND.

Brands Ordinance, 1900, and Brands Ordinance Amendment Ordinance, 1908.

To the Deputy Registrar,

.....

Herewith we enclose the prescribed fee of.....and request that you will allot and register a brand for the holding or place mentioned in the Schedule below.

Name of Applicant in full.	Address.	District or Sub-district for which Brand is required.

Date.....

.....

Applicant.

SCHEDULE B.

Brands Ordinance, 1900, and Brands Ordinance Amendment Ordinance, 1908.

No.....

..... day of

I hereby certify that the brand shown in the diagram at foot hereof was duly registered on the date and asthe brand of the person(s) therein set forth in the schedule hereto.

Owner(s)' full Name.	Address.	District for which Brand is registered.	Date of Registration.

Fee paid.....

Diagram of Brand.....

(Signed).....

Registrar of Brands.

SCHEDULE C.

MEMORANDUM OF TRANSFER OF BRAND.

Brands Ordinance, 1900, and Brands Ordinance Amendment Ordinance, 1908.

We,.....being the registered owner(s) of the brand set forth in the schedule hereto, do hereby agree to the transfer of the same to.....of.....and hereby request that the same may be registered accordingly. And we....., the second undersigned, do also hereby agree to the said transfer and enclose the fee therefor (..... Shillings).

Witness..... Owner.

Address.....

.....

Witness..... Transferee.

Address.....

.....

Brand.	Name and Address of Registered Owner of Brand.	District where Brand is Registered.	No. of Certificate.	Date of Registration.

No. 228 of 1909.

Department of Agriculture,

Administrator's Office,

Salisbury, 7th October, 1909.

WHEREAS the disease known as "foul brood" exists, or is supposed to exist, among bees in Australia, New Zealand, and the continent of America, including the West Indies, and the continent of Europe, including Great Britain and Ireland:

Now, therefore, under and by virtue of the powers vested in me by the "Injurious Substances and Animals Ordinance, 1909," I do hereby declare and make known that—

1. From and after this date it shall not be lawful for any person to introduce or cause to be introduced into Southern Rhodesia, except with the written permission of the Director of Agriculture, and subject to the production, in the case of each consignment, of sworn declarations in accordance with the forms set forth in the annexures contained in the schedule hereto, as the case may require, bees, beeswax, foundation comb, honey, used beehives, or used beehive accessories or appliances, or any article or thing that has been used to contain or manipulate bees or beeswax.

2. The above prohibition shall not apply to the introduction of bees, beeswax, foundation comb, honey, used beehives or beehive accessories from any neighbouring Colony or State which shall by its own regulations have prohibited the importation of bees, beeswax, foundation comb, honey, used beehives or beehive accessories, subject to the aforesaid exemption to any neighbouring Colony or State.

3. Any bees, beeswax, foundation comb, honey, used beehives or beehive accessories unlawfully imported, or imported otherwise than in accordance with the provisions of these regulations, or found to be affected with any disease, shall be liable to immediate confiscation and destruction, or to be quarantined at the expense of the owner until, in the opinion of the Director of Agriculture, any source of danger has been removed or has disappeared.

4. Any person contravening the provisions of these regulations, or any directions or instructions given in terms of these regulations, shall be liable in respect of each offence to a fine not exceeding £100, or in default of payment thereof to imprisonment, with or without hard labour, for a period not exceeding one year.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,
For Treasurer.

SCHEDULE.

ANNEXURE "A."

Form of Declaration required to accompany Importation of Bees.

I / We do solemnly and sincerely declare that the undermentioned Bees were supplied by me / us to..... of.....on.....and that no Bee disease of any description exists on our premises or within two miles (three kilometres) thereof.

And I / we make this solemn declaration conscientiously believing the same to be true.

.....

Declared at.....this..... ...day of 19.....

Before me,

.....

Justice of the Peace
or other Officer authorised
to administer oaths.

Number of Bees referred to in this Declaration.....

ANNEXURE "B."

Form of Declaration required to accompany Importation of Beeswax.

I / We do hereby solemnly and sincerely declare that the undermentioned Beeswax supplied by me / us to..... of on..... has been melted for not less than two and a half hours, at a temperature of not less than 212 degrees Fahr., and has not subsequently been on premises, or within two miles of premises, where Bee disease of any description is known to exist.

And I / we make this solemn declaration conscientiously believing the same to be true.

.....

Declared at.....this.....day of 19.....

Before me,

.....

Justice of the Peace
or other Officer authorised
to administer oaths.

Quantity of Beeswax referred to in this Declaration

ANNEXURE "C."

Form of Declaration required to accompany Importations of Foundation Comb.

I/We do hereby solemnly and sincerely declare that the undermentioned Foundation Comb supplied by me/us to..... of.....on.....has been made from Beeswax that has been melted for not less than two and a half hours, at a temperature of not less than 212 degrees Fahr., and has not subsequently been on premises, or within two miles of premises, where Bee disease of any description is known to exist.

And I/we make this solemn declaration conscientiously believing the same to be true.

.....

Declared at this.....day of 19....,

Before me,

.....

Justice of the Peace or other Officer authorised to administer oaths.

Quantity of Foundation Comb referred to in this Declaration.....

No. 52 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 25th March, 1909.

CONDITIONS UNDER WHICH GOVERNMENT VETERINARY SURGEON'S SERVICES ARE AVAILABLE TO THE PUBLIC.

1. ON and after 1st April, 1909, the services of Government Veterinary Surgeons will be available to the public, free of charge for the following purposes only:—

(1) Attending and giving professional advice in connection with the following diseases, viz.:—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Footrot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lung-sickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

(2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

(3) Inoculations against the following diseases:—

Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater,

Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz.:—

	£	s.	d.
(1) For every professional visit within three miles of his office or residence	0	5	0
(2) For every professional visit beyond such distance plus an additional charge of 2s. 6d per hour whilst engaged in such visits, or £2 2s. a day of 24 hours;	0	10	6
(3) For advice given at the Veterinary Surgeon's office, for each animal, per visit	0	2	6
(4) The following to be charged in addition to visiting fees:—			
a. For every examination as to soundness, each	1	1	0
b. For castration, horses, each	1	1	0
c. ,, bulls ,, ...	0	5	0
d. ,, donkeys ,, ...	0	10	6
e. For parturition cases, mares, each	2	2	0
f. For parturition cases, cows, each	1	1	0
g. For other operations, according to nature, from 5s. to £2 2s.			

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government veterinary surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government veterinary surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the veterinary surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government veterinary surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government veterinary surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government veterinary surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 281 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 2nd December, 1909.

UNDER and by virtue of the powers vested in me by section 8, sub-section (1) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the removal of the following articles from areas known or suspected to be infected with any destructive disease:—

Skins, hides, green forage, hay of any sort, fodder, bedding, reeds, kraal or stable manure, or any article which may reasonably be supposed to convey infection, or infective insects.

Any person removing articles in contravention of the aforesaid prohibition shall be liable to the penalties on that behalf provided and to have such articles destroyed, in terms of section 5, sub-section (6) (a) of the aforesaid Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 262 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 25th November, 1909.

IMPORTATION OF CATTLE.

UNDER and by virture of the powers conferred on me by the "Animals Diseases Consolidated Ordinance, 1904," I do hereby cancel Annexure "B" referred to in sub-section (2) of section 1 of Government Notice 110 of 1908, as amended by Government Notice No. 87 of 1909, and in place thereof do substitute the following, which shall, from date of publication hereof, be the form required to accompany Annexure "A," also referred to in aforementioned sub-section.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

ANNEXURE "B."

I,.....
residing on the farm
in.....do solemnly and sincerely
declare that the..... (numbered in writing) animals also enumerated below have been in my possession since

birth, and that lung-sickness, pleuro-pneumonia or other contagious or infectious disease has not existed amongst any of my cattle, nor on my farm, nor among any cattle with which these animals have been in contact within the last four years, and that these animals have never been exposed for sale in any public market or stock fair, nor been in contact with strange cattle, and that to the best of my knowledge and belief such cattle in travelling to Station (*i.e.*, station where cattle are to be trucked) will not come into contact with any animals amongst which lung-sickness or any other contagious or infectious disease has existed during that period.

Number of Animals..... Bulls..... Heifers.....

Breed.....

Seller's Name and Address.....

.....

Purchaser's Name

Place in Southern Rhodesia to which animals are being sent

.....

And I make this solemn declaration conscientiously believing the same to be true.

.....

Declared to at.....on this.....
day of.....before me,

.....

Resident Magistrate for the district of

.....

No. 300 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 23rd December, 1909.

ESTABLISHMENT OF A POUND AT INSIZA.

UNDER and by virtue of the powers in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Bulawayo, a pound has been established on the farm "Magohlo," near Insiza, in the fiscal division of Bulawayo, and the said pound shall be available for the public from the 1st day of January, 1910.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 309 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 30th December, 1909.

IMPORTATION OF PLANTS &c., REGULATIONS.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that the following regulations shall be of force and effect on and after

st day of March, 1910:—

(1) No person shall introduce into Southern Rhodesia from outside Sout Africa any consignment of potatoes unless accompanied by a certificate from the consignor stating fully in what country and district of that country the potatoes were grown, and that the disease known as Warty disease or black scab, caused by the fungus *Chrysophlyctis endobiotica* Schil, is not known to occur on the land on which the potatoes were grown. Any consignment not accompanied by such certificates will be liable to be seized and destroyed.

(2) All consignments of potatoes which are imported from other parts of South Africa or from oversea, if found on inspection to be infested with any pest or disease, other than black scab, will be sorted at the expence of the consignee and the diseased tubers destroyed.

(3) A charge of 6d. per bag or case will be made for sorting.

(4) Should any consignment on arrival be found to be infested with black scab, it will not be sorted but will be totally destroyed.

(5) Any person guilty of a contravention of these Regulations shall be liable to a fine not exceeding £10.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 263 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 25th November, 1909.

IMPORTATION OF SWINE.

NOTWITHSTANDING the prohibition which exists under section 1 sub-section 3 of Government Notice No. 295 of 1908 against the importation of swine from the Colony of the Cape of Good Hope, I, under and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide that swine may be imported from the Cape of Good Hope under a permit issued by the Chief Inspector or Examiner of Stock, and subject to any examination and quarantine on entry that may be necessary, and to such other conditions as may be deemed expedient to attach to such importations.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 264. of 1909.

Department of Agriculture.

Administrator's Office,

Salisbury, 25th November, 1909.

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of horns and raw hides of cattle from the Bechuanaland Protectorate.

Any horns or hides introduced in contravention of this prohibition shall be confiscated and destroyed.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 10 of 1910.

Department of Agriculture,

Administrator's Office,

Salisbury, 27th January, 1910.

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of hides of every description from North-Western Rhodesia and Portuguese East Africa. I do further declare, in terms of section 5, sub-section (6) (a), that any hides introduced in contravention of this prohibition shall be confiscated and destroyed.

Any person contravening the provisions of this Notice shall, upon conviction, be subject to the penalties prescribed by the aforesaid Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 11 of 1910.

Department of Agriculture,

The Treasury,

Salisbury, 27th January, 1910.

IT is hereby notified for public information that the following appointments have been made under the "Animals Diseases Consolidation Ordinance, 1904:—

All Government Veterinary Surgeons who are at present or who may in

the future be appointed as such to be Inspectors.

All Native Commissioners and Assistant Native Commissioners who are at present or who may in the future be appointed as such to be Sub-Inspectors within their respective districts.

Abbott, Charles Frederick	Inspector	Victoria
Cameron, James Randall	„	Gwelo
Morris, Hugh Godfrey	„	Salisbury
Cameron, John	Sub-Inspector,	Lomagundi
Cumming, Guybon White	„	Enkeldoorn
Curran, Patrick	„	Umtali
Geise, Albert	„	Wankies
Glasock, Horace Harry	„	Salisbury
Gooyer, Edward Bertram	„	Gwanda
Harvey, William Egerton	„	Umtali
Hunt, William Ernest John	„	Hartley
Johnson, William	„	Insiza
Kayser, James Joseph	„	Mazoe
Leahy, Kenyon Arthur	„	Selukwe
Lee, Hans	„	Mangwe
Malan, Stephanus Henry	„	Bulawayo
McKenzie, Robert	„	Bulawayo
Orpen, Arthur Francis	„	Umtali
Van Straaten, Johannes Jacobus	„	Umtali
Whitie, John	„	Melsetter

By command of His Honour the Administrator.

F. J. NEWTON,
Treasurer.

No. 16 of 1910.

Department of Agriculture,
Administrator's Office,
Salisbury, 27th January, 1910.

UNDER and by virtue of the powers vested in me by the "Animals Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel the Regulations published under Government Notice No. 102 of 1909, as amended by Government Notice No. 244 of 1909, restricting the removal of animals from a certain portion of the Hartley district on account of a disease amongst live stock due to the organism known as Trypanosoma dimorphon.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON.
Treasurer.

Department of Agriculture.

TSETSE FLY DISEASE, HARTLEY DISTRICT.

ATTENTION is drawn to Government Notice No. 16 of 1910 which cancels the restrictions placed on the movement of all animals in the Hartley district.

This step is taken because it is considered that sufficient evidence has now been provided to shew that the disease which exists in Hartley district is normally transmissible by tsetse fly only.

It is intended to deal with all cattle in the neighbourhood of the fly areas by restricting them under section 15 of the "Animals Diseases Consolidation Ordinance, 1904."

ERIC A. NOBBS,
Controller of Stock.

Salisbury, 28th January, 1910.

Department of Posts and Telegraphs,

Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EYRE,
Postmaster General.

General Post Office, Salisbury,
20th July, 1909.

South African Stud Book

A RECORD of all classes of Stock, the object being to encourage the breeding of Thoroughbred Stock, and to maintain the purity of breeds, thus enhancing their value to the individual owner and to the country generally.

Applications for Membership, and entries of Stock should be addressed:

For Cape Colony to

A. A. PERSSE, P.O. Box 703, CAPE TOWN.

For Transvaal to

F. T. NICHOLSON, P.O. Box 134, PRETORIA.

For the Orange River Colony

E. J. MACMILLAN, Government Buildings, BLOEMFONTEIN.

A. A. PERSSE,
Secretary South African
Stud Book Association.

AFRICANDER BULLS.

Three Pure Bred Africander Bulls for Sale, two 4-tooth and one 6-tooth respectively.—R. Bliss, Ayrshire.

PERSIAN SHEEP RAMS.

These Rams are all picked from our well-known Longhope Stud; winners of over 100 prizes—Port Elizabeth, Rosebank, and Bloemfontein.

I have now a portion of this stud on my farm, near Penhalonga, Rhodesia, and am open to take orders for Rams now on hand, and also to book for next year. Price, £3 10s. on truck, Umtali.—Apply, Douglas Abrahamson, Penhalonga.

BERKSHIRE PIGS

From imported strains. Orders booked and on hand from progeny pure bred prize winners. Prices from 40s. The best obtainable. Winners of Firsts: Queenstown 1908, Bulawayo, Gwelo 1908, Salisbury 1908-9.—Apply, J. Arnold Edmonds, Glen Lorne, Salisbury.

MESSRS. MACLAURIN BROS.

(Breeders of Pedigree Friesland Cattle.)

Orders are being booked for young pure-bred Friesland Bulls bred by pedigree sire and dam.

These Bulls are bred and reared on the Farm Pomona, near Salisbury, a Redwater area, and thus farmers may obtain highly bred animals without the usual risks attending importation and immunising.

Particulars of pedigree and prices will be obtained on application to Messrs. Maclaurin Bros., Salisbury.

THE RHODESIAN

AGRICULTURAL JOURNAL

Edited by the Director of Agriculture
assisted by the Staff of the Agricultural Department.

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Editorial.

STUD FARM AND EXPERIMENTAL STATION. — Cattle breeders throughout Rhodesia, and the term includes every farmer, will be glad to learn that the proposals often made that Government should itself undertake the task of providing suitable bulls, is likely at an early date to be realised and take definite shape. It is proposed to set aside a sum for the purpose of establishing a joint stud farm and experimental station, and, if passed by the Legislative Council, active steps will be taken at once.

It is an unfortunate fact, amply and often proved, that the mortality of imported breeding stock both from the South and oversea is exceedingly heavy, so heavy as to discourage many from endeavouring to produce a class of animal that will grow bigger or faster or give more milk than the native or at best than the Africander native cross. The chief cause of this mortality is undoubtedly redwater or some of its associated troubles, referred to as secondary reactions, veld sickness and so on. Losses both of bulls and heifers in the

process of acclimatisation have been heavy, and of late several prominent importers have become so discouraged that, except on fixed orders on behalf of others, they have ceased to bring in cattle from outside, and their caution cannot reasonably be condemned. Artificial inoculation of importations is not unattended with risks and is as a rule beyond the skill of private individuals. On the other hand we have the consolation of knowing that stock bred in the country become virtually immune by veld inoculation as calves, and herein we hold a key to a means of vastly improving our herds. Once the blood is provided it is in the hands of every farmer to decide for his own particular case whether it is better to breed a type which is little better than the common Victoria, Angoni, or Barotsi, but which can look after itself, or one which on the other hand will require better attention and care than he has been accustomed to give to his stock but which will furnish a finer, heavier carcase in a shorter time, and a better financial return. The art of the breeder will be to combine as much of these desirable properites with sufficient hardiness to enable the stock to subsist on the veld.

The Immediate Aim and Means.

To secure at least an opportunity for such improvement of our stock is the object of the proposed stud farm, by providing bulls for the purpose of grading up a better stamp of cattle based on our native breeds. If pure bred animals can be immunised and acclimatised in sufficieut numbers there will before very long be ample half-bred stock from which by a process of further crossing of selected specimens in time to arrive at that "Rhodesian standard" indicated as so eminently desirable by Professor Wallace. That, however, is a goal not to be achieved under several generations of systematic breeding and by selection out of large numbers of cross-bred animals. To make any effective impression considerable numbers are necessary. It is proposed to import and place upon the stud farm a number of pure-bred bulls and cows; the former, after artificial immunisation and opportunity to contract natural infection by several months under ordinary conditions, will be distributed over the country; the latter, after a similar treatment, will be used for breeding further bulls in the country itself. In this way it is hoped to meet the immediate demand for bulls and to

continue the supply indefinitely. The progeny of these pure-bred animals out of common stock will in time provide half-bred stock from which to continue the grading up of the indigenous cattle or to produce the standard breeds already alluded to. As this production of "standard breeds" is more or less a theoretical speculation, it is within the province of Government to experiment or to assist others in experimenting, and this should not be impossible satisfactorily to arrange in connection with the Stud Farm and Experiment Station.

Opinions Wanted.

There are a thousand questions which arise in connection with a proposal of such vast importance to the future of the pastoral industry of Rhodesia, and the expression of view on the subject by those interested is cordially invited. Perhaps the most vital point is that of selection of breeds to be encouraged. Obviously the number is limited by financial considerations, by the practical inadvisability of running many breeds on one farm and by the fact that one of the chief aims of breeding, if, as seems likely, we are one day to be a beef exporting country, must be to produce in large numbers an article of constant uniformity, a definite type. In these circumstances the choice of breeds to be encouraged is of vital importance. Already we possess sufficient experience amongst the breeders of cattle in Rhodesia, to be a material guide in this matter and the lessons learnt by neighbouring colonies are also available to us.

In recent numbers of the JOURNAL we have dealt exhaustively with the Friesland and Aberdeen Angus breeds and we hope to discuss the rival merits of others in future. The choice is large, for besides the above, there are Herefords, Devons, Sussex, Shorthorns and Africanders to be thought of, and Lincoln reds if dual purpose animals come into consideration, besides other breeds which are not without their adherents. The subject demands ventilation and discussion and the support of those interested in order that the benefits of the proposal, which has done so much for the farmers of the Cape and Transvaal, the Orange River Colony and British East Africa, may also be extended to Rhodesia.

An Agricultural Experiment Station.

The desirability of establishing experiment stations has frequently been voiced at the Agricultural Union Congress, by farmers' associations and by private individuals, and it is hoped that in conjunction with the proposed stud farm this wish may also be realised and means provided for the adequate investigation in a practical manner of the many problems connected with the growing of crops and the possibility of introducing new ones, the arrangements of profitable rotations, the establishment of new industries, and trial of improved processes and appliances and generally the incubation of improved methods whereby the profits of the farming industry can be increased. The field is a wide one and the promise of tangible results great, although of necessity some time must elapse before authoratative conclusions can be attained and the influence of these felt throughout the country. There must be a beginning.

CONTAGIOUS DISEASES OF LIVESTOCK.—No extensive outbreak of disease is in existence in Rhodesia; there is yet occasion for the moment for special watchfulness and anxious care lest what outbreaks we have should extend or new troubles invade the country. The outbreak of African Coast Fever in the Imbezi Valley, the only existent active case of this disease in Rhodesia, is in course of being suppressed; the proximity of considerable numbers of stock in the Penhalonga mining area close by gives special cause for drastic action. There is African Coast Fever in the district of Zoutpansburg, Transvaal, on our southern border, though fortunately not very near the frontier, here formed by the Crocodile River. To protect this territory steps have been taken to clear all cattle from within twenty miles of the border, to which end a cordon has been established and any stock found within the prohibited zone will be destroyed. To the north anthrax has been discovered and active measures for its suppression taken.

After several years of freedom lungsickness has invaded the Tati Concession and an outbreak exists a few miles to the south of Francistown. It behoves us to prevent this scourge from entering our territory if possible, and here again restrictions of movements have been enforced and further protective steps are contemplated. Although much

less frequent than previously, rabies still lurks in the country and recurs sporadically and mysteriously, rendering precautions necessary.

It is with much regret that, after ten years' freedom, we should again have to record cases of glanders. The origin of the outbreak at Bulawayo has been determined, and all possible steps to trace, test and deal with in-contact animals are at the time of writing being taken. There is every prospect of limiting the disease to the cases already infected. It is hardly necessary to remind readers that for this disease there is no cure and that immediate destruction of infected animals, disinfection of anything by which the disease could be conveyed such as bits and bridles and so on, is the only reliable course, and ought to be undertaken at once by everyone who is unfortunate enough to find glanders among his horses and mules.

THE COMING AGRICULTURAL SHOWS.—The prize lists for our forthcoming shows are now out and show in all directions an ambition to go one better than last year. The Salisbury Prize List has been liberally prepared, including no fewer than twelve in the cattle section, two cups and a special prize for horses and six for produce, and two cups for sheep breeders. Amongst these are the fifty-guinea challenge cup and gold medal for the best bull in the show and the Stewarts and Lloyds trophy for the best animal bred in Mashonaland and the President's cup to the most successful exhibitor of cattle. A novel prize is the silver cup presented by Mr. N. A. Arnold for the best wagon load of mealies, consisting of 20 bags, to be shown on the wagon. The leading firms of the town have come forward generously and presented prizes in the useful form of a cream separator (The B.T.A., Ltd.), a Swift steel plough (Messrs. Philippi & Co.), a mealie sheller (Messrs R. Berg Hardware Co., Ltd.), and a New Deere adjustable arch 2 spring row cultivator (The A.A.T. Co., Ltd.). The vice-chairman offers a prize for an orchard competition which should stimulate a new interest.

Umtali will as last year be the first show of the season, the date being fixed for the 9th and 10th of June. It will still, unfortunately, not be possible to have any show of cattle. The society has accordingly wisely specialised in the small stock classes and in fruit, and if the committee can surpass

last year's exhibits in these lines they may well be satisfied with their show and with their district.

While each separate prize list has no doubt been prepared by those most interested and in accordance with the ideas of those immediately concerned, it seems rather a pity that in many details there should be a want of uniformity in corresponding classes at the three shows. For example, there, the description of stock, the weights of exhibits of produce and the like differ at each show. If alike at the different centres it would have enabled exhibitors to enter for two or even all three shows, and would also have facilitated comparison of rival winners at different centres, thereby materially increasing the useful purposes of friendly rivalry for which agricultural shows are specially intended to foster.

As is but right the cattle classes are the main feature of the Bulawayo prize list. These are liberal and well arranged to meet present conditions. Thus special prizes are provided for the express purpose of demonstrating the effects of grading, the prizes being given for cross-bred heifers sired by pure-bred bulls, the breed of the dam being immaterial but to be stated on the entry forms, and whenever possible the dam is to be shown with the heifer.

Milking tests and butter tests are provided and should do much to educate the public in the judging of milch cows not only by appearance and performance at the pail but by the more subtle and more crucial test of production of butter fat. Sheep are limited to five, goats to four, classes, while poultry (including pigeons) have sixty-six separate classes, and are thus well provided for.

Under the head of Food Products a special prize is offered for articles made exclusively from South African grain of any kind or kinds.

The competitions usual at such meetings are provided for generously, and the show promises from every point of view to be attractive, instructive and successful.

THE REPORT OF THE DIRECTORS.—The report for the year ended 31st March, 1909, presented to the shareholders of

the British South Africa Company, has now reached us. The following extracts are of special interest to farmers:—

"The Company requires to be satisfied in every case that persons desiring to purchase land possess enough capital to ensure a reasonable prospect of success, and personal occupation is also insisted upon. While the effect of these conditions is to limit, to some extent the rate of settlement, experience has shewn that the policy is sound and that settlers with the requisite qualifications will be forthcoming.

"During the year ended 31st December, 1909, the sales of land amounted to 1,386,973 acres, and a further 162,000 acres have been applied for by prospective buyers.

"According to the latest returns from Rhodesia 863 persons were actually settled upon the land during 1909, and applications in respect of another 111 settlers had been received.

"One of the most important events of the year has been the purchase by the Liebeg's Extract of Meat Co., Ltd. (Lemco and Oxo Company) of 400,000 acres of ranching land in Southern Rhodesia after personal examination by a highly qualified expert. The terms of purchase include a provision that the land must be stocked within a period of five years. An option to the end of the present year has also been granted to the Liebeg Company to acquire further areas on similar terms.

"For many years past a number of authorities have expressed most favourable opinions in regard to the possibilities of cattle raising in Rhodesia, and it is satisfactory that these opinions have been confirmed in so practical a manner by an undeniable authority. The establishment in Rhodesia of an important undertaking of this character must prove of great benefit to the country. It will be the means of introducing valuable breeds of cattle, and will provide a ready and expanding market to which breeders may look for the sale of their stock."

FORESTRY.—We are glad to announce that the services of Mr. T. R. Sim, formerly of the Natal Forest Department, and a recognised authority on the subject, have been secured to make investigations and to furnish a report on the question of the exploitation and conservation of the forest wealth of Rhodesia, and on the systematic planting of trees for commercial use.

Mr. Sim will be given opportunities of examining types of our various forest regions and of areas where artificial afforestation is desirable. It is anticipated that Mr. Sim will arrive towards the end of April and that his tour will last several months and much importance attaches to his conclusions and to the recommendations he may make.

The Director of Agriculture will be glad to hear of persons desirous of meeting this expert, or to receive the views of any interested in the subject, in order that the fullest possible information may be laid before him during his visit to Rhodesia.

OUR CONTRIBUTIONS.—In this issue we furnish a variety of articles of an instructive character. The practical notes on dealing with two rather common occurrences during the parturition of calves, by Mr. Sinclair, Chief Veterinary Surgeon, will no doubt be useful to many who at critical moments find themselves beyond the reach of veterinary advice and are at a loss what to do. The article on the building of homesteads by Dr. Mackenzie, of Hartley, contains sound advice. It was recently read before the Farmers' Association at Hartley, and will no doubt be read with interest by a wide circle of readers. The whole subject of ensilages is succinctly but exhaustively discussed by Mr. Godfrey Mundy, and is opportune, as now is the time to take thought for the morrow and provide out of our present abundance for the certain scarcity of the winter time of succulent food for stock.

No apology is offered for giving a statistical account of farming conditions in Salisbury district, for if this contains pipers news to many readers, yet there are others who wish to know what is going on in our "home counties" where relatively speaking "high farming" may profitably be

pursued. In our next issue we hope similarly to deal with one of the remote limits of Rhodesia—the Melsetter district.

VETERINARY SURGEONS.—Mr. Jarvis, G.V.S., at Umtali, proceeds to Europe on leave, and proposes to devote some of his leisure to the study of recent advances in Tropical Medical Science.

Mr. Speer, G.V.S., is temporarily transferred to Umtali.

KIMBERLEY REEFS FARMERS' ASSOCIATION.—Again we have the pleasure of announcing the establishment of a new Farmers Association; this time for the Kimberley Reefs neighbourhood. Mr. Moorcroft, of Dandazi, has been elected chairman; Messrs. Watermeyr, Newitt and P. Rademan members of committee; and Mr. Geo. Oswald Smith honorary secretary. The fact of new associations springing up over the country is proof of the desire of farmers to unite in their common interests and a high compliment to the utility of the already existing organisations.

MIGRATION OF THE GREAT LOCUST BIRD.—For some years past certain European scientists have been marking birds in order to study their migrations. Amongst the kinds marked is the White Stork (Ciconia alba). This bird leaves Europe in the Autumn of the year and migrates to South Africa where it wins respect as a locust destroyer of the highest importance and is widely known as the Great Locust Bird. A few marked by an aluminium leg ring have been found dead or have been accidently shot in the last couple of seasons, and these circumstances have been reported in Europe. Now the "South African Central Locust Bureau" at Pretoria is in receipt of a communication from the Director of an official German institution interested in the matter, in which it is respectfully requested that the South African public be notified that the return of any rings found would be deeply appreciated by the authorities. Therefore, it is urged upon anyone coming into possession of such a ring to mail it to the European address stamped upon it, or else to forward it to the Director of Agriculture, Salisbury, who will mail it to the proper party for him. Should the ring be

retained by the finder, it is requested that at least a copy of the marks found upon it be forwarded.

This is one of the birds specially protected in Rhodesia under the Game Law Consolidation Ordinance, 1906, so that the public are warned not to shoot them in their search for rings.

AN INTERNOTIONAL CONGRESS OF TROPICAL AGRICULTURE AND COLONIAL DEVELOPMENT is to be held at Brussels in May. It is five years since such a congress was called together in Paris when representatives of all nations assembled. The Director of the Imperial Institute, London, Dr. Dunstan, is interesting himself in the collection of papers from the congress from British workers in Tropical Agriculture. The field covered includes economic botany, forestry, utilisation of agricultural and forest products, economic entomology, economic zoology, including the care and breeding of stock; tropical and colonial hygiene, especially as this affects the settler in the new countries; agriculture and agricultural engineering. From the ventilation of ideas on these subjects information of value must result and the reports of the Congress will be awaited with interest.

SCHOOL COMPETITION: ECOMOMIC BOTANICAL COLLECTIONS.—In June last notice was given of a series of prizes offered to school children throughout Rhodesia for a collection of wild plants possessing commercial use or of importance for other reasons. Not only specimens but information concerning them, native names, the position and date of collection, a general description, and the importance of the plant for food or fibre, as timber, medicine, poison, grain, weed and so on.

The competition closed on the 28th February and has now been adjudicated. The order of merit is as follows:—

First (£4), J. Gardiner, St. George's School, Bulawayo.
Second (£3), Maud Bain, Salisbury High School for Girls.
Third (£1), Lionel and Harold Cripps, Fernhill School, Umtali.

The number of specimens comprising these collections is quite satisfactory, but the individual material is frequently very incomplete, and leaves much to be desired from a botanical point of view.

The winner of the first prize scored heavily on account of the excellent manner in which his specimens had been pressed and dried, but lost points owing to looseness of botanical description, such as colour of flower, general appearance of plant, time of flowering, etc. His idea of specialising on plants considered by the natives to possess medicinal properties is praiseworthy. Plants supposed to possess poisonous properties either to human beings or to animals and those having possible economic value for manufacture or export would be of equal scientific interest and of greater real worth. The winner is to be congratulated on his success, but should he make any further collections of this sort he must pay greater attention to securing complete material—leaves, flowers and fruit, and give a more botanical description of the plants. But this criticism apart, the collection was very praiseworthy indeed and quite merited the first prize.

The second collection has several good points, but here again the material is occasionally scanty. Her style of describing the specimens is good, but in many instances native names have not been given, which is a pity. A mistake has been made in sewing specimens to the sheets, as this frequently damages them. The specimens of timber are particularly good and have obtained full marks.

The entry which obtained third prize is very disappointing both to the judge, and no doubt, to the competitor. The descriptions, both botanical and economic, are very good, as are the specimens of timber. The pressed specimens were of the maximum number, namely, one hundred, and it is evident that considerable pains were taken in making the collection. Here again the material was often too scanty, but the great fault lay in the fact that the specimens had not been properly pressed or dried, and consequently when they arrived were largely in a mouldy condition. On this account 17 per cent. were quite useless, and an additional 19 per cent. were practically valueless. Had the specimens been dry and properly pressed in accordance with the conditions of the

competition and directions furnished, this collection would unquestionably have taken first place,

Much interesting material has by means of this competition been collected and brought to notice and it is hoped that if repeated next year it will bring out even stronger competition more especially from farm schools, where children are in an even better position than those residing in towns, to collect interesting specimens.

TO OUR READERS.— Subscribers to the JOURNAL are particularly requested to send full postal address together with their subscriptions. Often the name of the farm only is given, which is insufficient. Complaints of delay or non-delivery are largely attributable to this omission.

We welcome the suggestion made by a writer in our correspondence columns that farmers of experience should, through the medium of these pages, assist others with practical advice and timely hints, and take this opportunity of inviting their kind co-operation to make the JOURNAL of more use to all. We shall be glad to receive contributions, whether articles or letters, on topics of interest to Rhodesian farmers.

CORRIGENDUM. — ARTICLE ON THE POTATO TUBER MOTH. — Owing to the reduction of the original plate in the process of reproduction, the lines indicating the the insect's natural dimensions are incorrect. As the plate appears in this article, the figures only very slightly exceed the actual size of the insects.

Accidents to Cows after Calving.

By J. M. Sinclair, M.R.C.V.S Chief Veterinary Surgeon.

Under this heading I propose to discuss two conditions which frequently occur in cows in this country after normal birth of the calf. These are Retention of After-birth and Inversion of the Uterus or Calf Bed. I am prompted to these subjects not because I have anything original to suggest in regard to their causes, or to any new methods of treatment which would enable the stockowner to deal with cases in a pink pills sort of manner, but because enquiries are frequently addressed to me asking for immediate and preventive treatment.

The term accident is scarcely correct in regard to either condition, it is used however in the sense of something that proceeds from an unknown or unforseen cause.

RETENTION OF AFTERBIRTH.

It would serve no useful end here to give an accurate description of the anatomy of the uterus and for practical purposes the following rough description is all that is necessary:—The uterus is an elongated sac which receives the ovum, which after fertilisation remains therein for a definite period of nutrition, development and growth, until a fully formed specimen of the species is expelled. In shape the organ consists of a body and two horns, the former is simply a round cavity slightly flattened above and below, the anterior part of which divides into the two horns which extend forward and upward, each of which is connected with the ovaries of its own side, the body is separated from the vagina, the passage from the outer opening of the uterus, by a constriction known as the cervix or neck. The cavity of the body of the uterus communicates with the vagina by a narrow canal which traverses the neck or cervix and ends posteriorly in a prominent rosette sort of body, that is in the ordinary condition. After the birth of the calf the entrance and passage may be so dilated as not to be easily determined but as a rule the parts may be definitely distinguished.

The inner surface of the uterus is covered with rounded smooth prominces, not unlike a mushroom in shape, these are called the cotyledonal processes or Cotyledons. They are found in the body and horns of the uterus and are attached

to the walls thereof by a short pedicle or stem; in the calf they are about the size of a pea and in the full grown animal as large as a coat button. In the pregnant animal they number about eighty to one hundred and twenty and are considerably increased in size, and frequently assume various shapes. The after-birth or as it is more correctly termed the placenta or foetal membranes is connected to these cotyledons by somewhat corresponding bodies, the former are called the maternal and the latter the foetal cotyledons. It is important to remember that these constitute the only connection between the young animal with its coverings and its dam and it is due to the continued union of these bodies after birth that we get the condition known as "Retained afterbirth."

Symptoms.—When part only of the membranes is retained the symptoms are generally so marked that the condition of things is obvious, but in some cases no trace of the afterbirth can be seen, or may be visible only when the animal is lying down. As a rule the animal suffers no uneasiness or discomfort, but in some cases, symptoms of pain, whisking of the tail, stamping of the hind feet, lying down and rising up, and occasional straining may be seen. After a few days putrefactive changes set in, these are evident from the repulsive odour. The health of the animal often suffers, there is fever, increased respiration, diminution in the supply of milk, loss of appetite and other general symptoms of illness.

Causes.—Retention occurs most frequently in cases of abortion or when birth takes place some days before the proper time. The condition is said to be more common in old cows, and especially when these have been employed in draught. It may be caused by the rapid contraction of the neck of the uterus after the birth of the offspring: allowing the calf to suck too soon, mouldy food, milking too soon, cold water and many other things have also been assigned as causes, but there is no satisfactory evidence in connection with any of these.

Retention occurs in all classes of animals and under all conditions, in the well bred, well fed show cow as well as in the veld fed animal. In Rhodesia most cases occur in the winter months and it is just as often seen in cows in good condition as in the poorer ones. It is I think reasonable to suggest that in most cases which occur at this season of the year the condition is caused by the lack of tone and vitality, even in well conditioned animals, which results

from the dry innutritious grass. Spring with its seasonable rains, fresh young herbage, warmer nights and days, is generally speaking the time ordained by nature for all animals to reproduce their species in a natural and healthy manner. When conditions are altered either by accident or design a penalty will be exacted in some cases and I take it, retention of the afterbirth in cows which calve in winter is one of the forms of such penalty. I know that some persons will say that they have never seen any cases of retention except in spring and summer, the causes of these cases I must assign to mouldy food, milking too soon, perhaps to the changes of the moon, and so forth.

Treatment.—The treatment of this condition is most unsatisfactory, many drugs have been recommended and are constantly used in practice but I must confess that I know of no medicine which will cause expulsion of the retained membranes in a satisfactory percentage of cases. Removal of the membranes by any of the methods generally practised and which will be described later, often results in serious and in some cases fatal injury to the cow.

Many hold that the retention of the afterbirth is not in itself dangerous and that unless complications arise its removal should be left to the efforts of nature, whilst others assert that there is great risk in detention beyond two or three days. In the former case no real expulsion may ever take place, the membranes simply undergo putrefactive changes and are discharged as a dirty coloured foul smelling fluid, on the other hand many cases occur in which very little change takes place and the membranes are discharged after six or seven days in a fairly normal condition.

The too early removal of the afterbirth by hand or other form of traction when still firmly adhering to the uterus through the maternal and foetal cotyledons may cause serious injury to the wall of the uterus and to the cotyledons which may easily be torn out, the results are that septic material which exists to some extent in all cases is more readily absorbed and cause serious and often fatal systemic conditions.

How is one to be guided when he has a case to deal with? It may be taken I think that where the birth has been normal and where the cow is in good health, not suffering any pain or inconvenience, normal appetite and temperature there is no need for interference until at least a week or more has elapsed.

If however the birth has been difficult, the organs concerned torn and inflamed and symptoms of general systemic disturbances, e.g., high temperature, loss of appetite, diminution of milk, shivering, etc., intervention is then called for, no matter whether the time which has elapsed since birth is long or short.

It will be generally found that where a considerable mass of afterbirth is protruding the discharge of the whole will not be long delayed. The question of treatment therefore has to be decided on the course and the symptoms presented by each particular case.

As it has been previously remarked the administration of medicines for the purposes of causing the expulsion of the afterbirth is not attended withuniformly satisfactory results, no harm however can be done by administering a purgative in all cases about the third or fourth day, combined with ergot, stimulants and aromatics. Ergot stimulates and contracts all involuntary muscles and acts therefore on the wall of the uterus and together with stimulants may in some cases at least, cause a contracting of the walls of the uterus which would continue naturally until expulsion takes place.

I would suggest the following drench:—

Glauber or Epsom Salts, 1 to 1½ lbs.
Freshly powdered Ergot, 1 to 2 ounces.
Corbonate of Ammonia, ½ ounce.
Powdered Gentian or Ginger, ½ ounce.

Dissolve the ingredients except the ammonia in boiling water and add ammonia when cold. The latter would with advantage be given separately in cold gruel.

In cases where the symptoms indicate that the mechanical removal of afterbirth is necessary the following method is practised:—The visible portion of the afterbirth is gently twisted until the whole is in the form of a rope, the hand is gently inserted into the uterus, the thumb and index fingers are placed round the neck of the maternal cotyledons and the adhering placenta gently pulled off; the process is not unlike the undoing of the buttons of one's coat by the finger and thumb, but it is very difficult and tiresome and requires patience and some degree of skill which comes only with practice. It is important to point out that this operation is attended with serious risk to the operator. Many cases of septic poisoning having resulted. Antisepties should be freely used during the operation, indeed before attempting it I consider it necessary to wash out the uterus as far as possible with a strong solution of Permanganate of Potash



(No. 1.)

Truss used after return of an Inverted Uterus:

In No. 1 the ends of the rope may with advantage be tied to loop on top of neck. See also No. 2.



(No. 2.)

or other antiseptic. No person however who has cuts or abrasions on his hands or arms should attempt the operation.

A very common practice and in many cases a satisfactory one it to tie a light weight to the protruding portion of the afterbirth and leave it there, the constant traction often stimulates the uterus to normal expulsive movements.

Another method is to place the protruding portion of the afterbirth between two thin sticks and roll round them until close to the external genital opening, then gentle traction with a circular movement is exerted and as the parts come out the rolling of the sticks is continued, this should be practised daily until the whole finally comes away.

In cases where the animal shows serious systemic disturbances, high fever, etc., a good smart purgative, preferably salts, should be administered, followed up by daily doses of one teaspoonful of Carbolic Acid and half an ounce of Quinine, together with stimulants such as Ammonia, Dop, etc. as indicated.

INVERSION OF THE UTERUS.

The cow is more liable to this accident than any of the other domestic animals; it is fortunately comparatively rare but most cattle owners have had at some time or other to deal with such a case.

Inversion of the uterus or "falling of the calf bed" may be partial or complete, this however is not a matter of much importance to the ownerwho finds one of his cows with something outside which he knows should be inside, what concerns him most is how to get it back again and keep it in position until it remains there without any extraneous assistance.

Symptoms.—The organ is generally expelled by the powerful uterine and abdominal muscular contractions. These expulsive efforts cause the inversion of the uterus in the first instance and offer in the second place great obstruction to its return and retention in position when so returned. I speak from sore and tired experience as an operator.

The inverted uterus generally has the appearance of a huge calabash shaped tumour, reaching in some cases to the animals hocks. Its colour and consistence depends on the time which has elapsed since its appearance, in the early stages it is generally a bright red colour, later it assumes a darker hue as a result of stagnation of the blood circulation, which is complicated with dirt, straw, dung, etc., adhering

to it. The organ rapidly increases in size and if not returned ulceration and gangrene quickly supervene. From the commencement the animal shews signs of pain, by lying and rising, swishing of the tail, pawing the ground with the fore and stamping with the hind feet, and strains more or less energetically at frequent intervals which add to the size of the extruded mass. General systemic symptoms such as fever, increased pulse and respiration follow and the prostration and the weight of the organ soons compels the animal to remain in the recumbent position. The animal is unable to empty the urinary bladder, the contents of which are gradually being added to, hence another source of suffering and danger to life.

Causes.—Inversion generally occurs within two or three days of calving and although it does occur in cases where the calving has been easy and rapid it is more likely to occur in cases where labour has been long and difficult and much force used. The predisposing causes are a weak flaccid uterus with a dilated neck. These are more likely to exist in heavy plethoric animals, or those suffering from lack of tone or vitality brought on by debility from disease, or bad or insufficient food. What the actual or exciting cause is it is difficult to say, but is probably of nervous origin.

Treatment.—The animal must if possible be got up, and kept up until the organ is returned. It will be found very difficult to complete the operation while the animal is lying down. The first step is to place the uterus on a clean sheet, its weight supported by an assistant on either side, the organ is then carefully sponged with warm water, care being taken not to injure it in any way, if there is much pain a few ounces of tincture of opium should be added to the cleansing fluid. Some operators prefer cold water and the use of ice is recommended in order to allay the irritation and reduce the size of the organ. The following method may be used to reduce the size of the organ:—A clean piece of linen about a yard long and 30 inches broad is passed beneath the inverted uterus and close up to the edge of the external genital opening, the lower border is then lifted over the organ and one of the ends folded over it (just like folding a piece of paper in four) the four corners of the wrapper are then uppermost and the organ entirely within it, tepid water is applied to the cloth which is gradually tightened by placing the open hand beneath the mass and with the other hand pulling at the edge of the wrapper. If

this process is continued for about twenty minutes it will be found that the size of the organ will be much reduced and its return rendered easier. In the actual operation of returning the uterus it will befound necessary to have, in addition to the two assistants suporting the organ in a sheet, another one to assist in the manipulations of the operator; another may be employed to hold the tail back and pinch the cow's back to prevent arching and straining, a surcingle may also be placed round the chest with the same object and three or four ounces of tincture of opium administered by the mouth will considerably reduce the opposition to the return of the organ.

It is difficult to explain how the actual return of the uterus is managed, but if it is borne in mind that the parts which come out last must firstreturn, the intelligent cattleman will soon see when dealing with a case the best way to accomplish the return of the whole. One great difficulty is that when you have succeeded in returning a portion of the mass you require both hands to keep it there, indeed for this sort of work one could very well do with a second pair of hands. However with a little judicious help from one of his assistants, together with patience and caution, it will generally be found that after a little has been returned the next is somewhat easier, the mass becoming less and less until it finally disappears. When the organ has been successfully returned the operator will, if he takes my advice, put his arm into the passage and keep the uterus in position unti some arrangement has been made to prevent its being again extruded, otherwise he may find that he has to do the whole thing over again.

If a syringe or spray pump is available the organ should be well washed out with a warm solution of permanganate of potash; a one in three thousand solution of corrosive sublimate is best but this requires a glass or rubber syringe for its use. This solution is easily prepared from the Soloids, which are obtainable at any chemists.

The uterus having been returned the next step is to adopt measures which will ensure its retention until such time as the straining has ceased and the neck contracted sufficiently to retain the organ in position. Although not in great favour I think the simplest method for use on the farm is the pessary, which is an instrument placed in the gential passage: various forms are made but as these are not usually available when required some-

thing must be substituted, an ordinary knobkerrie with a round smooth head and about two feet long will be found to serve the purpose quite well, its head should be about three or four inches in diameter, a short loop of cord is inserted in a hole bored in the other end. Before insertion this instrument should be soaked in a strong solution of Jeyes Fluid or other antiseptic for at least half an hour, then dried, and well smeared with oil or melted lard, it is then inserted in the passage and a cord tied to the loop is carried forward on either side of the beast and attached to a surcingle placed round the chest. I have on several occasions used a Champagne bottle, with a strong piece of stick the required length placed in the bottle down to the bottom, inserted in the passage and tied in the same way as the knobkerrie. This however is a rather dangerous article, because it is liable to break and cause serious injuries. Another method and perhaps the most satisfactory, when properly done, is that of suturing. Three sutures are generally sufficient and are placed transversely in the external gential opening. A good strong sacking or strong saddler's needle and some strong whipcord are required, the needle is passed through one lip of the opening and then through the other, and must be deep enough and include sufficient skin to stand a heavy strain, the ends of the suture are then tied in the middle: pliable copper wire makes an excellent suture.

Trusses are also used, these are made from a long rope and the method of application willbe readily understood from the attached illustration.

When the uterus has been returned and some means applied to keep it in its place it may be necessary if severe straining continues to give a large dose, say four ounces, of tincture of opium. It will be generally found however that the animal quitens down in an hour or two and in most cases recovery is rapid. The pessary or stitches should be removed on the second or third day. Of course in some cases if the animals hind quarters are raised and straining rapidly ceases the organ may remain without any mechanical assistance, but it is not advisable to risk this.

The general condition of the animal may also require attention, a mild purgative, soft sloppy food, stimulants if weak, washing of the uterus if there is any fetid discharge and various other things which the observant cattleman does not require to be told about.

Houses for Farmers.

By A. J. MACKENZIE, M.B. B.Sc. (Edin.)

A paper read before the Hartley Farmers' Association.

In this paper I propose to review briefly the ordinary types of dwellings in common use in Rhodesia.

In a country such as this the style of dwelling is usually dependent upon (a) the kind of material which can be procured at the smallest cost; and (b) the rapidity with which it can be erected.

In very many cases the question of whether the proposed building is likely to be healthy or not is left out of consideration. Another point frequently lost sight of is that the cheapest form of building requires constant renewal, and therefore can hardly be said to justify itself on the score of economy.

Let us take first of all the commonest type of house one sees, viz, the wattle and daub hut with thatched roof. An ordinary hut can be erected with door and windows complete for £10. The diameter would be, say 16 feet.

I think it can safely be said that the average duration of such a hut is not more than two years.

From the hygienic point of view such a building has nothing to recommend it. It is practically impossible to make an ordinary mud hut mosquito proof; and in addition, the thatched roof and mud walls form ideal shelters for other insects of every kind. On these grounds I think the pole and daaga hut must be condemned.

Another type of hut is the green brick circular hut with thatched roof. This can be built for about £20 with sawn pine roof timbers, door, windows and ceiling. This is a more lasting kind of building and, of sourse, is much better than the daaga hut, but it still leaves much to be desired.

The Kaytor hut—16ft. diameter—brick lined, mosquito proof and with floor can be built for £45. This may be an excellent type of dwelling for Europeans in some places, but in Hartley I do not regard it as suitable. My experience is that in this district they are always far too hot for comfort. The same objection applies to the ordinary wood and iron buildings as commonly seen. Efficient ventilation and coating the iron with suitable paint improve these houses greatly. A point in favour of this class of dwelling is the ease with which it can be removed from one site to another. It can also be made mosquito proof.

Leaving out of consideration stone houses, by far the best are those made of burnt brick. These houses of course can be made to any design, according to the taste and purse of the owner.

A simple form of house, consisting of two rooms 15x14, one room 12 x 16, open porch 10 x 16, walls 14 inches thick and all completely mosquito proof and with iron roof can be built for about £140. Such a house should be built on a brick foundation, and this would add a little extra to the cost.

Too much stress cannot be laid upon the absolute necessity of the settler having a mosquito-proof house. As we all know, malaria is one of the greatest scourges of this country, and accordingly it behoves us all to take all the precautions which science has proved effectual in checking this disease.

Besides the mosquito, there are other insects which convey disease of various kinds. The common house fly has been shown to be a powerful factor in the dissemination of diarrhoeal diseases, not to speak of the trouble and annoyance it causes in a house. As previously stated, a thatched roof is not desirable, and I think it will be found that iron is much better from every point of view.

Turning now from the question of the house itself I would ask you to consider with me for a few moments what are the factors which should determine us in choosing a site. The problem of a water supply is one that first strikes the intending builder. I have seen houses built on the bank of a stream so that the occupier should be near his water supply, and I need hardly tell you that this is folly of the worst kind, as he exposes his family and himself to almost certain malarial infection.

There should be no collections of water near a house, and therefore one ought to build on a slope where there is sufficient natural drainage. Black ground is always bad whether found in a vlei or in mopani. A house should be built on the windward side of a vlei, because mosquitoes do not travel readily against the wind.

Taking it all round it is best to build on red soil.

In conclusion, I would ask all intending builders to make their house on the following lines :—

(a) Pick the best site you can.
(b) Build the best house you can.
(c) Do not be content with making the house mosquito-proof, but keep it mosquito-proof.

Brief Notes on Blood Sucking Flies.

By RUPERT W. JACK, F.E.S., Government Entomologist.

It has been the writer's frequent experience when endeavouring to obtain evidence of the presence of tsetse fly at a certain spot, to be told that a fly had been seen there which was thought to be, or which the informant was "almost certain was" tsetse. As reliable information as to the occurrence of the "fly" at a given locality is highly desirable both from the point of view of the stock-owners living or working near by, and from the point of view of the Government officials who are engaged in investigating "fly disease," it is felt that it will not be out of place to disseminate further information as to the general appearance of the tsetse and the characteristics by which it may be distinguished from other flies, for it is quite certain that no man once familiar with tsetse will fail to recognise it definitely at first glance, or will be guilty of mistaking any other fly for it. It is with this object that the adjoining plate has been prepared. At the top of the plate at figs. 1, 2, and 3, are three specimens of the common tsetse fly "Glossina morsitans," presenting something of their natural appearance in a resting position—the position in which they are almost invariably seen when alive. The wings overlap like the blades of a pair of scissors, and the proboscis projects in front of the head. The position of the wings is most natural in fig. 1. As has already been pointed out to readers of this JOURNAL, it is the conjunction of these two characteristics which distinguishes the tsetse flies from all other genera of Diptera. To illustrate this point let us take a glance at fig. 4. The fly is very much the same colour as G. morsitans and its wings overlap in a similar manner, but apart from its smaller size, it differs from the tsetse in that no projecting proboscis is visible in front of the head. As a matter of fact this is not a blood sucking fly at all, its proboscis being soft and fleshy and hidden beneath the head. It belongs to a

family of flies which in the maggot stage are parasitic on other insects, namely the "tachinidæ." This specimen was taken in a flower in the Hartley "fly area." Fig. 15 is a further illustration of this method of carrying the wings when at rest. Unfortunately the wings have slightly relaxed in the specimen figured; in life they overlap as completely as do those of the tsetse. Note the absence of the projecting proboscis. This is a fly which is supposed not to live indigenously in Southern Rhodesia, but to be constantly introduced from the Cape Colony on horses and mules. Its habits in the adult stage are more nearly parasitic than those of the other blood-sucking flies with which we have to deal. It lives on the body of its host, its legs being provided with specially modified claws to enable the insect to cling to the hair. Locally it is frequently referred to as the "horse fly," though this name is more generally applied to the genus "Tabanus" in other parts. Its scientific name is "Hippobosca rufipes." The life history of this insect is somewhat similar to that of the tsetse. It produces a fully developed maggot which in a few hours changes to a pupa. The egg and larval stages common to most flies are thus done away with as distinct stages in the development of the insect.

Perhaps the nearest ally to the tsetse is the species of the genus "Stomoxys." Figs. 5, 6 and 7 represent specimens of the ubiquitous "stable fly," "Stomoxys calcitrans." This insect rivals the house fly in the extent of its distribution, and if commonly mistaken for that insect. Reference to the plate will, however, reveal a characteristic which this fly possesses in common with the tsetse, but which is not found in the house fly. This is the pointed proboscis projecting in front of the head when not in use. The wings of the "Stomoxys," however, diverge from the base, which distinguishes the genus at once from "Glossina." The life history of "Stomoxys" is similar to that of the common house fly. The eggs are laid in manure and decaying substances, in which the maggots live. They are white like those of the house fly. The flies are usually most abundant about buildings and kraals, especially those that are not kept very clean, but I have seen them in numbers attacking donkeys on the veld near a homestead on a hot day, causing the animals no little annoyance.

The remaining flies represented on the plate belong to the large family "Tabanidæ." The life histories of all the

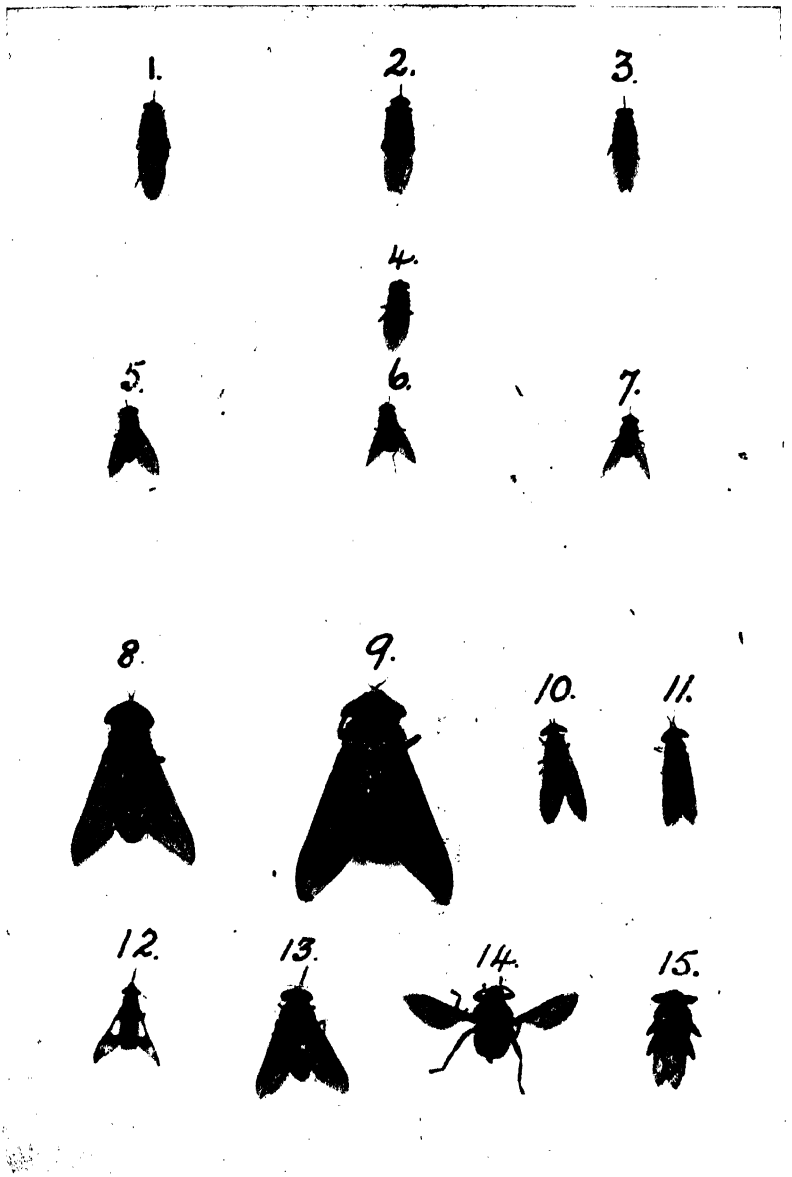


Photo by] [R. W. Jack

Blood-sucking Flies common in Southern Rhodesia

For explanation see end of article.

different genera or this family that have been studied are essentially similar. The eggs are deposited in masses on grass, stems of plants, etc., over water or marshy ground or other situations where moisture is not lacking. The larvae live in water, damp earth, etc. They are furnished with strong jaws and are predaceous upon other small insects. The adults are not likely to be confused with tsetse, for not only do the wings overlap, but the proboscis if hidden beneath the head in all the genera with the exception of "Pangonia," when the insect is viewed from above. In most genera the wings diverge from the base like those of Stomoxys, but in the "blind flies" (Hæmatopota sp.) they lie close to the body and meet in a "span-roof" fashion over the middle line of the abdomen. Only the females of this family suck blood, the males living on the juices of plants and sometimes on sweet liquids such as honey dew. The females will also feed on these substances when blood is not available. In consequence of this diversity of habit, the females are much more frequently caught than the males. All the specimens figured are females. The writer has found the bites of these insects peculiarly severe, an experience which has been amply corroborated by his native bearers and by the behaviour of animals attacked. Blood commonly issues from the wound after the removal of the proboscis with members of this family.

At Fig. 8 is shown a specimen of "Tabanus taeniola, var. diversus," one of the most widely distributed and abundant of the "hippo flies," as they seem to be generally termed in this part of South Africa. This insect is particularly abundant in the hot weather before the rains, during October and November, and it is no uncommon sight to see an ox's legs bleeding profusely from a score of places as a result of the attacks of the "hippo fly." The writer has, however, taken a few specimens as late as February, and probably they are to be found throughout the wet season in small numbers. Fig. 9 represents a specimen of "Tabanus biguttatus," a large and conspicuous insect widely distributed throughout Africa as far north as the Soudan. It is nowhere very abundant. The specimen figured was taken in the Hartley "fly" area near the Suri-suri River on the back of a native. The insects figured at 10 and 11 are commonly known as blind flies (Hæmatopota sp.). Blind flies are found

all over the world, and a number of species are to be found in this country. From the writer's experience they have a strong tendency to occur in patches in the bush and on the veld, suddenly attacking the wayfarer in numbers though none may have been previously encountered during the day's journey. Their flight is quite silent, differing in this from that of the "hippo flies," which is commonly accompanied by an audible buzz. Allowing for difference in size, however, their bite is just as severe.

Figs. 12 and 13 represent two genera, which are widely distributed, but specimens are nowhere to be found in great numbers. Fig. 12 shows a specimen of the genus "Chrysops," characterised by the length of the antennæ. The projection in front of the head is not, as might be supposed, the insect's beak, but the antennæ which have stuck together in the specimen figured. The beak is hidden under the head. Fig. 13 is a specimen of the genus "Pangonia." In this genus the beak is visible from above. In some species it is very much longer than in the one figured. In at least one South African representative it is considerably longer than the body, but it is doubtful whether the bearer of the unwieldy weapon ever uses it for sucking blood, probably confining itself to a vegetarian diet. The species at Fig. 13 is, however, quite bloodthirsty.

Blood sucking flies have latterly come very much into prominence on account of the discoveries made during recent years of the power of many of them to carry the germs of disease from one animal to another, not excluding human beings. The number of species against which a conviction has been obtained is constantly increasing, and there are many others against which scientists have "a case," or at least just cause for suspicion.

In no part of the globe are these insect-transmitted diseases more rampant than in Africa, and in particular in that part which lies close to or within the tropics. It cannot be too earnestly impressed, then, upon residents in Southern Rhodesia, that knowledge of the species of blood-sucking insects, and of their near allies such as ticks and tampans, etc., is essential for the welfare both of themselves and of their flocks and herds. In knowledge of species is included that of habits, distribution, seasonal prevalence, and the other

items which make up the sum of information without which it is not possible to formulate successful measures of controlling diseases conveyed by these silent enemies of mankind. The co-operation of all readers of this JOURNAL is therefore most earnestly invited to assist the staff of the Agricultural Department with material for notes. Any specimen of blood-sucking insect, be it tick, tampan, louse, flea or fly, will be welcomed. If it be accompanied by notes so much the better, but the mere fact of a certain specimen having been taken in a certain locality is of value. Specimens of the first four may be sent in dry or preserved in spirit, *but flies should always be packed dry as otherwise they are of practically no value.* They may be packed in a small box on a little soft crumpled paper or similar substance. The box should be strong enough to stand the passage through the post. Matchboxes are unfortunately not strong enough. Parcels should be addressed to :—

The Government Entomologist, Salisbury.

Ensilage.

By H. Godfrey Mundy, Agriculturist and Botanist.

Ensilage or the making of silage has been written about so repeatedly and so exhaustively that little originality can be claimed for the following remarks, yet in spite of this, no apology is needed for emphasising the value of a practice to which South African farmers as a whole (Rhodesian farmers not excepted) devote far too little attention. The terms ensilage and silage are probably more or less familiar to most of us, yet a more intimate acquaintance is frequently wanting, and for this reason it may be well to deal with the subject as though it were entirely new and unfamiliar.

If a definition is sought, we shall find that "ensilage" is the process by which green and sappy fodder is preserved for an indefinite period of time in a succulent state, and in a condition palatable to farm stock. "Silage" is the name given to the product, and the structure or pit in which the fodder is preserved is called a "Silo." The term 'stack silo' indicates that the product is placed in a stack above ground, and that by applying similar principles the same result is obtained.

A certain amount of mystery is often attached to the making of silage, yet the process is an exceedingly simple one, and merely devolves itself into taking suitable precautions to prevent the ingress of air, once the silo is closed, and so to arrest heating and fermentation before decomposition has gone too far. The storage of grain in pits or huge jars is an applied form of the process, and has been employed by primative races for centuries. Even to the present day the native races of the African continent adopt this method, which is also in vogue in India, Central America and elsewhere. Ensilage in its present form has been known in Europe for upwards of a century and thence has been reintroduced into America, Australia, India, and other countries liable to prolonged droughts, as the surest and most economical method of providing succulent green feed for farm stock during times of scarcity.

Silage is of two kinds, sweet and sour. In the process of making silage, heating and fermentation accompanied by cer-

tain chemical changes take place and the character of the product is governed by the rise in temperature which is permitted. A rise in temperature, or heating as it is more commonly called, is brought about by access of air, hence if the silo is imperfectly packed, too much air is allowed to enter, over-heating takes place, and if the action is not arrested excessive decomposition sets in and the product becomes worthless for feeding purposes. It will thus been seen that strictly speaking there are not several different kinds of silage, but rather many gradations between two extremes, namely, sour silage and sweet silage. With moderate compression and slow filling free oxidation takes place and sugar is formed producing sweet silage.

Heating and chemical changes are due to the oxidising action of the living protoplasm of the cells of which plants are composed. If pressure is exerted immediately, air is excluded and the available oxygen for causing combustion is gradually extracted from the other cell contents, thus the latter slowly pass through various stages of conversion from starch to sugar, to alcohol and acetic acid, finally eventuating in sour silage. Sour silage is usually said to keep better after the silo or stack has been opened for use than sweet silage, and when stock become accustomed to it, they often appear to prefer it. On the other hand sour silage frequently has a more unpleasant odour, and is therefore more liable than sweet silage to taint the premises and so affect the flavour of milk. When the temperature does not rise above 120 degrees F. to 130 degrees F. the product is sour or green silage; while between 130 degrees and 160 degrees F. various gradations of sweet or brown silage are reached. Above 160 degrees F. the silage becomes burnt and very undesirable.

For general purposes on intermediary stage between sweet and sour silage is considered most desirable, and this will usually be obtained at a temperature varying from 125 degrees to 135 degrees F.

It must not be thought from the above details that absolute precision of temperature is necessary or even highly desirable. With the utmost care the same gradation is seldom reached two years in succession, and by using ordinary common sense and by following a few simple instructions, good quality silage can be produced without the aid of a thermometer.

In filling or building the Silo it is usual to fill in some four to six feet depth of green fodder at a time, and after allowing this to rise to the desired temperature, to add another layer and so on. As each subsequent layer is put in it is stamped down firmly, particularly round the sides—thus access of air to the lower layer is prevented—the temperature ceases to rise, and fermentation goes but little further. In a similar manner the temperature of the second layer is permitted to rise to the required height before the third layer is filled in and so forth. Firm packing at all stages of the operation is absolutely necessary, otherwise too much air will be permitted to enter.

It will now be understood that if for any reason it becomes necessary to fill the silo continuously thus preventing the temperature from rising, sour silage must be expected, while on the other hand should causes arise to delay the filling beyond the prescribed time, there will be a danger of excessive heating resulting in burnt silage. When this is likely to occur a reasonable amount of water may be thrown over the silage, and in this way the temperature can be lowered.

If the crop is too mature and not sufficiently succulent when cut to give the required fermentation water may be added to induce the necessary rise in temperature.

Practical farmers often prepare silage by rule of thumb methods, and when the surface of the mass becomes so hot that the hand and fore-arm can only bear the heat with slight discomfort, more fodder is added. As with other things practice makes perfect, but no one need be deterred from making an initial attempt, and if the above instructions are more or less accurately followed, the results in the majority of cases will be surprisingly pleasing. If a thermometer is used, it is customary to set a piece of piping in the middle of the silo and to build around this. The temperature can then be read by attaching a string to the thermometer and lowering it down to the necessary depth in the pipe.

In filling a pit silo the fodder should be brought to 1 to 3 feet above ground level to allow for sinkage. Where the pit is sufficiently large a quiet horse or mule or even calves are often lowered and allowed to tramp the fodder, thus taking the place of boys' labour.

Some difference of opinion exists as to the relative merits of using long unchopped fodder as against chaffed fodder, but where both methods have been tested, preference is almost invariably given to chaffing. The machine should be set to cut the material into lengths of from half to one and a half inches, and speaking generally with coarse fodder the shorter the cut the better.

At first sight it may appear an unnecessary labour and expense to pass the forage through a chaff cutter, but after doing so the process of packing is greatly facilitated, and when the time comes to open the silo, the material can be handled far more expeditously since it can be more easily taken out, and can be filled into bags and carried to the feeding place. Chaffed silage is also better for feeding since it can be readily mixed with chopped dry forage, crushed maize or meal where these are also fed. The actual labour of chaffing is not great. The chaff-cutter is placed in position beside the silo, the green fodder is brought up and fed into the machine, and as it passes through is packed into the silo. Where a pit is used, the cutter can be placed in such a position that the fodder falls into the pit direct. In making stack silage, long fodder is almost invariably used. Again it may be emphasised that chaffing, though advantageous, is not wholly necessary, and the fact that a chaff cutter is not available is no good reason for abstaining from making silage.

The relative merits of different forms of silo have been a fruitful source of argument since silage first came into vogue. In America, Australia and other countries where durable timber is abundant and cheap, the usual form of silo is an overhead erection made of wood and banded with iron, and often taking somewhat the form of a huge barrel. In other instances the structure is made of masonry, and in either case is roofed with wood or iron and has a series of feed doors at convenient spacing up the side. Silos of this nature are costly to construct, and for economic working a blower or elevator is necessary when filling, after the fodder has been chaffed. The chief advantages of these silos is greater ease in handling and the fact that the product is secure from damage from rain or weather. In South Africa where for the most part the rainfall is a summer one, and where the cost of erecting a timber or masonry structure

would be considerable, pit or stack silos will usually commend themselves.

A pit silo is formed by excavating a convenient sized hole in the ground of suitable shape, and may be either round, square, or rectangular oblong. The pit should be dug in soil of a tenacious character in order that the walls may remain firm and not crumble into the pit. A dry well-drained position should be chosen so that the silo may be free from seepage of underground moisture, and similarly means should be taken to protect it from surface drainage. When making the pit in the first instance, the work should not be undertaken until towards the close of the rainy season, and the sowing of crops for silage can be regulated so that they will be ready for cutting about the beginning of April, by which time the heavy rains will for the most part be over. Before commencing to fill the pit it is advisable to line the sides and bottom with coarse grass or green reeds and thus the silage is protected from coming in direct contact with the earth walls. If brick or stone is available, and presuming a permanent site has been chosen for the pit silo, it is often well to face the sides and bottom with this material, but if the silo is to be of a temporary nature only, or where the excavation is in firm tenacious soil, this is not necessary. Having filled the silo in the manner previously indicated, a layer of grass or straw is thrown on the surface, and on this a layer from six to twelve inches in depth of dry soil well tramped, or a lesser coating of earth and then one of loose stones to give the necessary weight. The covering of earth should be raised at the centre so as to throw off any rain that may fall after the pit has been closed, or failing this and should the pit have been filled early in the season, a few sheets of iron can be placed over it to serve the same purpose.

The stack silo is built in the same manner as a hay stack, except that the forage used is green instead of dry. The stack is usually circular, and to facilitate building, it is well to place a circle of poles in the ground and build inside this. The stack is made with long fodder and the butts are usually placed outwards, care being taken that the centre is always higher than the sides in order to throw off any moisture that may collect. When the stack is completed a thatch of grass is advisable and pressure is usually put on by weighting the

top with large stones or bags of dry earth, though in some cases these are replaced by heavy baulks of timber. In the latter case by means of chains passing over the stack and pulleys, pressure is exerted and the fodder is pressed down firmly. Yet another method is to make the stack in a slight excavation and to ride the wagon on to the stack, empty it, and then ride it off on the other side. In this way the stack has sloping sides, and the fodder is firmly pressed down by the weight of the wagon and the animals continually passing over it.

Pit and stack silos each have their advocates, for the latter it is claimed that less labour is required, while the animals can be permitted to feed direct from the stack. On the other hand it is more difficult to exert the required pressure, and a considerable area of the stack is exposed to the atmosphere, thus entailing much waste. The writer personally favours pit silos for this country as being more economical, and, as a general rule, producing better quality silage though in certain cases where it is desired to preserve very large amounts of fodder in this form, and where feeding by hand would entail too great labour, stack silos undoubtedly have their advantages.

Consideration must be given to a suitable site for the silo. Masonry and timber silos are usually only constructed where cattle are fed under shelter or in byres, and in such cases are built close to or as part of the main building, in order that feeding can be carried on expeditiously and with a minimum of labour. Pit or stack silos should always be situated on rising, well-drained ground. When choosing a site it must be remembered that silage is weighty and bulky to handle, and the silo should therefore be in as close proximity to the feeding place as possible.

Generally speaking any succulent green crops are suitable for ensilage, but some are better adapted and of higher feeding value than others. Grass silage is occasionally made, but as a rule it is better to grow crops expressly for this purpose, and the cost of growing and cutting a cultivated crop yielding six to fifteen tons per acre will not greatly exceed that of cutting, raking and collecting a far greater area of veld grass, while the feeding value can be made immeasurably higher. The following crops are eminently suited for the purpose, and can be readily grown in Southern

Rhodesia, often on land which requires a rest from the staple crop: Maize (Zea mays); Sweet sorghum, "Imphe" (Sorghum sacchartum); Pearl Millet, "Nyouti" (Pennisetum spicatum); Manna (Setaria Italica); Japanese Millet (Panicum crus-galli); Finger Millet, "Rapoka" "Rukweza" (Eleusine coracana); Toesinte (Euchloena Mexicana); Sugar Cane (Saccharatum officinarum); Velvet Beans (Mecuna utilis); Cowpeas (Vigna catjang); Kaffir Beans (Vigna catjang var.); and Sunflower (Helianthus annuus). Amongst the finer strawed crops we must include Boer Manna, Japanese Millet and Egyptian Clover. These latter are however equally suitable for conversion into dry fodder, and would usually be saleable at a good price on local markets. Boer manna has already established its reputation as a useful crop in rotation with maize, while heavy yields of velvet beans and kaffir beans may be anticipated from lands which are becoming exhausted from continuous maize cropping, and which would otherwise be allowed to lie idle, incidentally becoming a fruitful source for the dissemination of weed seeds throughout the rest of the farm.

A decision as to what crops to grow must be based on the class of land available and the prevailing conditions of climate, but it may be remembered that the addition of leguminous crops will greatly enhance the feeding value of the silage, and in actual practice about one-third bean, pea or clover forage to two-thirds maize, sorghum, etc., has been found a desirable proportion.

The best time of cutting varies somewhat with the different crops. For silage, maize is usually considered in the best condition when the grain has reached the "glazed stage." If cut later than this, it is somewhat liable to turn mouldy. Sorghums and millets are best cut when a little short of maturity, while cowpeas and velvet beans are probably in the most suitable condition when the beans are well formed in the pod but not yet hard. As with lucerne, clovers should be cut when in flower.

Silage can be fed to all classes of farm live stock, but more particularly to cattle. It is especially useful for stimulating the flow of milk—hence its popularity amongst dairy farmers. It is often fed to sheep with great advantage, both before and after lambing time. Stock unaccustomed to silage frequently refuse it at first but soon learn to appre-

ciate it and eat it with avidity. When commencing to feed only small quantities should be given and the amount gradually increased. No more should be given than can be consumed at one feeding, as it rapidly deteriorates and becomes unwholesome. For dairy cows it is well to feed after milking otherwise the odour of the silage by dissemination in the cow shed may affect the flavour of the milk. For cows 20 to 40 lbs. of silage can be fed per diem in addition to dry forage, meal, etc., and to other stock in proportion.

The feeding value of pure maize silage is somewhat higher than that of root crops such as mangels, swedes, turnips, and in countries where the climatic conditions make the growing of these somewhat precarious, maize silage can advantageously be used to replace them in the feeding ration.

Since crops for silage are cut green and preserved in a green condition, the weight of silage taken out after a period of several months will roughly approximate the weight of fodder cut from the field. Taking lucerne as an example, a crop running three tons to the acre will furnish approximately three tons of silage, yet this, if converted into hay, would only produce about one ton of dry fodder. Similarly one hundred and eighty tons of lucerne silage—equivalent to about sixty tons of lucerne hay—would contain about fifty four tons of dry matter, and would occupy less space than twenty three tons of lucerne hay containing twenty tons of dry matter. A cubic foot of silage weighs about thirty five to forty pounds, hence a small pit silo with measurements —length 18 ft., width 8 ft., and depth 6 ft., will contain about fifteen tons, while a larger pit 30 ft. x 15 ft. x 9 ft. will hold approximately seventy tons of silage. The form of pit here indicated is rectangular, since in practice when opening up the silo a smaller surface can be exposed to the air and there is therefore less waste than with a circular pit; for the same reason an oblong rectangular pit is preferable to a square one. On the other hand it is easier to pack the sides of a circular pit and great care must be taken to tramp the fodder well down in the corners of rectangular ones.

Most farmers have formed some idea of what it costs to grow an acre of maize. In a previous article we have estimated the cost of the actual labour entailed in growing an acre of maize from the first ploughing to the final cultivation at approximately 12/-. Some critics have considered

this figure too low, but since silage crops will hardly receive the same care and attention, as a maize crop grown for grain production should do, the figure may be allowed to stand. Cost of cutting, loading and hauling the crop to the silo, say £1 per acre—calculated on the basis that one boy can cut the crop from an acre in approximately five days as against picking and husking an acre in six and a half days.

A large chaff-cutter and horse gear will not cost more than £50, while a hand machine already used on many farms will cost much less. The labour required in feeding and turning the machine and filling the pit can be easily performed by 8 to 10 boys or about half the number if a horse gear machine is used. The cost of this labour may therefore be placed at 10/- to 15/- per diem. The amount of fodder that can be handled per diem will depend on the size of the silo and the capacity of the chaff cutter. The minimum with a hand machine may be placed at six tons a day and the labour for this amount, at the higher figure, will therefore approximate 15/-

In Rhodesia it would be a poor crop of maize that did not yield twelve to fifteen tons of green fodder per acre. Taking the lower estimate, twelve tons of fodder can be grown, cut and converted into silage at the cost of £3 2s., or at about 5/3 per ton. To this must be added a percentage of the cost of excavating the pit and a small sum to cover interest and depreciation of capital outlay on the chaffing machine, bringing the total to perhaps 7/6 to 9/- per ton. On the Government farm a pit 18 ft. x 6 ft. x 6 ft. was excavated in soft free working ground by four boys in four and a half days. Even presuming the cost was 12/- per ton, for this sum, succulent fodder, of equal if not greater feeding value than green barley—sufficient, in addition to dry forage, to feed a large framed cow for upwards of sixty days, or in other words for one third of the dry season, during which time other green fodder is either unobtainable or excessively dear, can be provided.

It will thus be seen that in ensilage we have a succulent, palatable and nutritious food which can be drawn upon any time after the first two or three months of laying it down and which can be grown and prepared with a minimum of risk and expense.



A Corner of the Seed Store.

The Agricultural and Veterinary Laboratory, Salisbury.

[CONTRIBUTED.]

The Research Laboratories of the Agricultural and Veterinary Department of the Southern Rhodesia comprises a block of buildings on a plot of ground to the north of the Salisbury township, adjoining the Golf Links and Polo Ground, and close to the Government Reserve.

The site was originally chosen for the purposes of a Bacteriological Laboratory, for the use of Dr. Robert Koch when he was pursuing investigations into the nature and remedy of rinderpest, horsesickness and rabies, and was latterly used more particularly for the latter purposes, whence it has come to be known generally as the Pasteur Institute,

Besides the laboratory buildings the place was equipped with suitable stables, and stands in its own grounds. With the addition of one large room, which serves as a veterinary laboratory, and some team sheds, outhouses and quarters for boys, there is now accommodation for the pursuance of scientific research work which is now becoming one of the main features of state aid in all progressive agricultural countries. It is as yet too early to look for concrete results, the laboratories having been in existence for only a short time and not yet completely equipped. It will however interest many to know what facilities exist and what is being done by the Department of Agriculture to enable the farmers of Rhodesia to benefit by the latest investigation of science and to harmonise the often apparently conflicting dictater of theory and practice.

At the outset it is well to dispel the notion apt to be formed that this is a model farm or anything approaching it. It is not, and the animals and crops met with are merely to be regarded as material used for experimental purposes or under observation. The main building contains the veterinary, chemical, entomological and botanical laboratories

and offices; the stables are occupied by all manner of animals providing means of study of stock disease, and close by is a piece of land set apart for demonstration and experimental crops on a small scale.

The veterinary research work is entrusted to Mr. Ll. E. W. Bevan, M.R.C.V.S. At the present time much time is devoted to the study of bovine, trypanosomiasis, more commonly called fly disease. A comprehensive interim report on this subject was published in the last number of the JOURNAL, but further enquiries are being prosecuted, comparisons made with fly disease from various sources, and the possibilities studied of applying preventive inoculation to animals obliged to work in fly areas.

It is in the Veterinary Laboratory also that countless smears are examined when suspicion arises of the existence of African Coast Fever, while similar blood examinations testify to the occurrence of Redwater in any of its forms, anthrax, so far fortunately not within our borders, and to other disorders. Cases of suspected rabies in animals come here for examination and identification by means of inoculation of rabbits.

Horse-sickness, and all cases of disease which requires special attention or investigation, are studied and the preventive inoculation against redwater of imported animals is superintended here also.

The accompanying illustrotions show the Laboratory and the implements and instruments, such as microscopes, incubators, autoclaves, filters, etc., which are used in the examination of the numerous morbid preparations sent in by cautious and up-to-date farmers and stock owners throughout the Colony, and for the minute study of the microscopic parasites chiefly responsible for the diseases of animals in this country.

Pictures are also given of the stables and fly-proof loose boxes and hutches, wherein are kept the large and small laboratory animals used in the systematic and close observations of the diseases which at present handicap the agricultural industry of Southern Rhodesia. In these experimental animals the course of the diseases and the progress of the causal organisms responsible for them is



A Birdseye View of some of the Experiment Plots.

watched from hour to hour. The actions of drugs upon the patients are carefully studied and vaccine and serums are obtained and tested.

In the Division of Agriculture and Botany, Mr. H. Godfrey Mundy deals mainly with variety experiments of crops, cultural methods, plant introduction, plant breeding by selection and hybridisation and botanical investigations regarding the identity and possible economic value of indigenous grasses, plants, trees, noxious weeds and so forth. Forestry work and the raising of seedling trees for sale to the public is also dealt with by this branch, but later on as the work extends it is anticipated that this subject will demand a separate division. In connection with the trial of crops thought suitable to the country, extended comparative experiments have been introduced, of which full particulars will be found from time to time under the heading "Departmental Notes" in this journal. The main object of these experiments is to test new crops as widely as possible, and so to obtain the fullest information as to their suitability to the various conditions of soil and climate which obtain in this country, in the shortest possible time. A second object achieved is that, where successful, they supply the experimentor with a sufficient amount of seed to pursue the cultivation of the particultar crop on a reasonably large scale. The seed for such experiments is issued by this branch as shown in the accompanying illustration. Plant introduction is also carried on at the Botanical Experiment Station. An area of about five and twenty acres adjoins the laboratory buildings, and here sundry new crops or improved varieties are being tested on a small scale before being distributed more widely. Instances of these are the new fodder crop, Helianthi, Toowoomba Canary Grass (Phalaris bulbosa), Spinless Prickly Pear, etc. Many of these trials must necessarily give negative results, but their value is not less on this account and will often serve to save farmers from needless loss of time and money.

Culture methods under trial include distance planting, dates of seeding, methods of cultivation, yields per acre, and, to a modified extent, rotation experiments, though these in time will be carried out on a larger scale elsewhere.

Plant breeding in its initial stages is being carried on with maize in order to produce a fixed type of Salisbury white—a locally evolved variety well suited to Southern Rhodesia, and of good quality for export. Hybridisation and selection of wheat is also receiving attention with the end if possible of achieving a strain resistent to rust in this country, and so suitable for growing during the rainy season. In the Botanical Laboratory plant determinations are made, native grasses of interest to farmers, suspected poisonous plants and plants of supposed economic value are investigated and, as far as possible, named. In connection with the investigation of poisonous plants feeding experiments are carried out, and since with our present limited knowledge suspicion is generally divided between several different plants feeding trials are extremely helpful.

An economic reference herbarium is in the making, but it will be some time before this is representative of the flora of Southern Rhodesia.

It would be out of place here to attempt a description of any of the experiments now under way, on the botanical experiment station. Personal inspection of the plots is invited, and it is hoped that farmers will take advantage of the close proximity of these experiment grounds to Salisbury and so keep in touch with the work carried on.

Plate I.—The Seed Store.

Plate II.—A birdseye view of the Experiment Plots.

The Entomological section is under the charge of Mr. Rupert W. Jack, F.E.S., Government Entomologist, and is devoted to the study of insect and other pests which attack the farmers' trees, crops and stock. As there is at present no mycologist attached to the Department, plant diseases are also dealt with to some extent by this section. Breeding cages, etc., are provided for the close study of the life history of insects, etc., to aid observations made in the field. The necessary appliances are provided for the examination of the minute anatomy of insects as an aid to the study of their nature and habits.

A collection of insects of economic importance is in process of formation for purposes of reference and demonstration,



A Corner of the Bacterialogical Laboratory.



The Stables.

and a large number of interesting specimens, preserved in cases, in spirits or formalin, have been sent in by enquirers or have been personally collected. This division co-operates with the Veterinary branch in the study of the transmission of certain diseases through the agency of insects and ticks, and much time is at present devoted to Tsetse Fly. All reports of the occurrence of "fly" are recorded on maps in the office, and other similar information accumulated for record, Here also are kept notes of the occurrence of locusts, and arrangements made for prosecuting the war against these destructive pests. The experiment crops grown in the lands attached to the Station are also available when necessary for experiments with insecticides and for the study of insect life history. An increasing number of farmers send in specimens of destructive insects and plant diseases which are examined in this office, and advice is given as to the best methods of applying remedial measures at present known.

The intimate association of agriculture with the science of chemistry has been recognised since the earliest times and and receives practical recognition in the work of the Agricultural Chemist, Mr. G. N. Blackshaw, B. Sc., F. C. S. The division of chemistry confines its attention to the Chemical investigation of all materials of Agricultural importance; the examination of soils, manures, crops, dairy products and so forth.

The Chemical Laboratory, which has recently been provided with a complete equipment, is divided into general laboratory, office and balance room, nitrogen room, and dark room.

GENERAL OUTLINE OF THE WORK OF THIS DIVISION

(1) SOILS—(a) Analysis of the various soil types, and manurial experiments conducted in the field with the object of ascertaining the most economical, and at the same time, profitable method of maintaining the productive capacity of Rhodesian soils. The importance of this work can not be

over-estimated, for, unless the system of soil treatment adopted permanently maintains fertility, land ruin must result sooner or later.

(b) Investigations with the causes of, and remedy for, infertility in certain soils.

(2) MANURES—Natural and artificial: Analysis of naturally occurring deposits, such as Bats Guano, Limestone and Lime Deposits to determine their value as fertilisers.

(3) CROPS—Examination of staple agricultural products and of indigenous plants to determine their composition and feeding or commercial value.

(4) DAIRY—The examination of milk and milk products, and investigations into the composition of milk yielded by cows of native and other breeds.

(5) MISCELLANEOUS ANALYSIS—Such as the examination of water, to determine its suitability for irrigation; the examination of animal viscera for poisons, etc.

Since all the laboratory fittings are not yet in position, it is regretted that illustrations of this department can not accompany this article.

DIVISION OF VETERINARY RESEARCH.

The large room on the Eastern wing of the building is occupied by the Research Division of the Veterinary Department, and contains the numerous appliances necessary for the study of the various minute organisms responsible for so many of the diseases of stock in this country. Here are the microscopes of high power which render these parasites visible; the incubators wherein they are cultivated under conditions favourable to their growth; the filters and centrifugalising machines which enable them and their products to be isolated and examined in bulk.

In this laboratory the following important work is performed:—

EXAMINATION OF BLOOD SMEARS AND PATHOLOGICAL SPECIMENS.

The Rhodesian farmer having realised that so many of the diseases of his stock are caused by microscopic organisms is not slow to avail himself of the facilities for obtaining an early diagnosis, and many hundreds of preparations are now forwarded to the laboratory for examination.

STUDY OF THE FOLLOWING STOCK DISEASES—

Redwater of Cattle.—This subject demands considerable attention, for it is realised that if the importation of better quality animals for the improvement of our local breeds is to be accomplished with safety, it is necessary to understand the dangers to which they are likely to be subjected on arrival in this country, and to establish methods of protecting or treating them.

The modern advances in the study of blood-parasites has shewn this subject to be extremely complicated and deserving of considerable attention.

African Coast Fever.—Blood preparations from animals suspected to be suffering from this dreaded disease are examined and the various methods are adopted for the differentiation of the causal organism of this malady from the many less harmful parasites which closely resemble it. Diagnosis made in the laboratory assists the worker in the field and influences the measures of prevention and eradication employed in dealing with outbreaks.

The Specific Lung Disease of Calves—Which has lately become more prevalent, here receives attention.

Rabies.—Inoculations are made with material sent to the laboratory from animals suspected to be suffering from this disease, and the regulations formulated for the protection of man and amimals alike, are largely based upon the results.

Malignant Jaundice of Dogs and other canine diseases are dealt with, and the results of treatment are closely observed from a scientific standpoint,

Horse-Sickness.—This all-important scourge and the many problems it offers to the investigator is the subject of close consideration.

Trypanosomiasis of Stock.—The recent attention which has been drawn to the diseases of stock caused by the trypanosomes, and the all important issues involved, have demanded a strict investigation into the identity of the parasites met with in so-called "fly-struck" animals in this and adjoining territories, the transmitting agents and the measures of treatment and prevention to be adopted in dealing with them.

Since man is also subject to a disease caused by a trypanosome, the study is of more than ordinary interest and importance.

Glanders, Tuberculosis, and many other diseases also receive attention.

The stables and animal rooms wherein are kept the large and small animals employed in the study of those numerous diseases are shewn in the illustrations.

Aberdeen Angus Cattle.

With reference to the article in our last number by Mr. W. H. Williamson, we have pleasure in reproducing two illustrations, one shewing the recently erected dipping tank on the Lendy Estate; the other, Mr. Partridge's Aberdeen Angus Bull, which is now running with his herd of native polled cows.

This bull, Rock II., of Wester Lochiel, was bred in Scotland by Mr. Peter Dunn, of Wester Lochiel, Whitehouse, and is by Rowley, of Inchsower, with a long stud book ancestry on both sides.



Photo by] [S. Speer

Aberdeen Angus Bull Rock II., of Wester Lochiel

The property of Mr. A. W. Partridge, of Lendy.



Photo by] [S. Speer

Dipping Tank in use at Lendy Estate.



Lowa Silver Mine Maize attacked by Maize Blight
(Helminthosporium turcicum pass.)
Note the wilted appearance of the leaves.

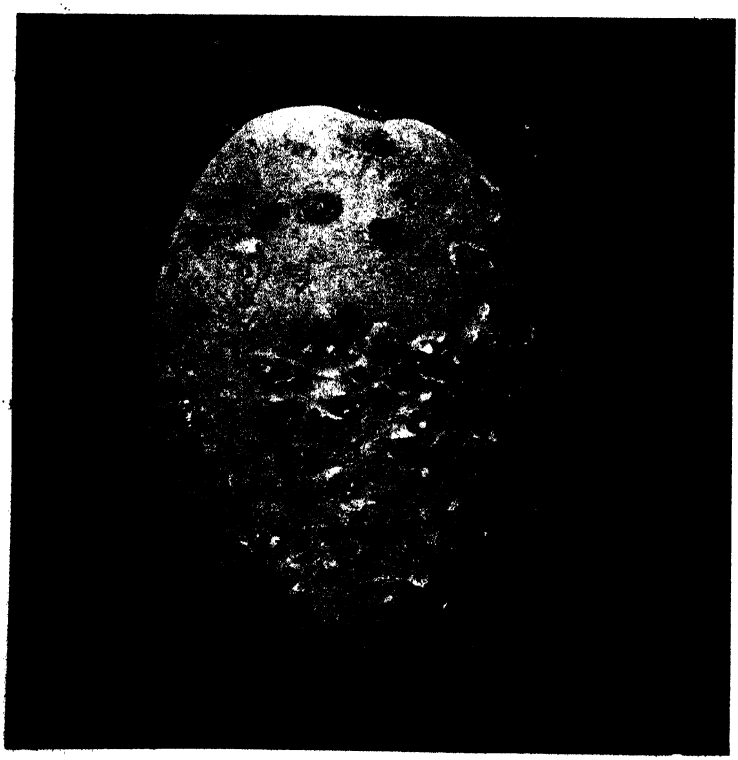


Photo by] **Tuber affected with Corky Scab** [Spongospora Scabies.] [R. W. Jack

Notes from the Agricultural Laboratories.

BOTANICAL.

MAIZE BLIGHT (Helminthosporium turcicum, Pass.).

Complaints have recently reached this office of the extensive damage done to the maize crop in several parts of Rhodesia by an unknown fungoid disease locally known as 'rust." The disease is probably more widely spread than is at present known, but appears most prevalent in the Mazoe district, and in particular on Moore's Concession.

The Mazoe Farmers' Association has taken active steps in the matter, and several initial experiments have been conducted by its members with a view to preventing or lessening the spread of this disease. Up to the present no definite results have been obtained, and experiments will be organised next season in order to more thoroughly investigate the trouble.

The writer recently visited some of the worst infected farms and concluded that the disease was Maize Blight (Heminthosporium turcicum, Pass.) and not a form of rust as previously supposed. Specimens of infected plants were afterwards forwarded to the Plant Pathologist of the Transvaal, who kindly confirmed this determination. The term "rust" should therefore be discarded in favour of Blight.

Maize blight is reported as often proving destructive to maize in Southern Europe, Queensland, and the United States of America. Massee states that the pest is a difficult one to combat and suggests that burning the fodder after the grain is harvested would be a partial remedy, while rotation of crops would be an even more certain preventative.

The blight first appears on the leaves in small pale patches, which under favourable conditions quickly increase in size, and in many cases run together forming large pale greyish-brown blotches. Finally the entire leaf may become affected only the midrib remaining turgid. The patches at this stage often turn brown, with a darker border, and are more or less covered with a delicate dusky mould. The lower leaves are usually first attacked and finally become quite dry and brittle and often fall to the ground.

The writer found that in many fields where the suckers had been taken off and left between the rows to rot, these were usually covered with conidiospores. The disease seems to make its appearance at all stages of the plant's growth, but present investigations suggest that it is most liable to appear when the health of the plant is suffering, either from drought, excessive moisture, or some such cause. Should further investigations prove this to be correct, careful adherence to the dictates of good husbandry may probably be one of the best remedial measures. Ridging up on wet ill-drained ground certainly appears beneficial, and by the same reasoning, careful cultivation in order to keep the surface soil loose and free from weeds should prove helpful during the spells of drought. The practice of leaving suckers lying between the rows after being cut is to be discouraged, as these may very possibly prove a source of renewed infection.

Some varieties of maize appear more susceptible to this disease than others, notably Iowa Silver Mine, Odessa maize, Eureka Field Corn, while Hickory King appears one of the most resistant. This fact suggests that by careful selection of seed a resistant type may be arrived at, and farmers whose crops are infected with the disease will do well to save seed only from plants which show a markedly resistant character.'

That the matter calls for careful investigation is shown by the fact that the Mazoe Farmers' Association estimate the loss of crop from this cause as high as twenty per cent. We shall be glad to learn the experience of farmers in other parts of Rhodesia where this disease is recognised as occurring.

NATIVE GRASSES.—ELEUSINE INDICA.

Specimens of a grass have been received from a correspondent farming on the sand veld of the Salisbury district, together with the information that this grass grows freely on sandy soil, especially where lightly manured, and suggesting that owing to its extensive root development it might be useful as a catch crop for hay, and as a means of preventing that packing of the soil which in this country, owing to heavy rains, is so common a difficulty with which farmers have to contend.

The plant in question proves to be "Eleusine indica," an annual grass sometimes called wire-grass, crab-grass or yard-grass, and in this country occasionally referred to as Rhodesian cocksfoot, though in nearly all respects quite dissimilar to European cocksfoot. "Eleusine indica" is closely related to finger millet, rapoko ("Eleusine coracana") the well known native grain crop, though the "fingers" are longer and much lighter and do not curl over as do those of "E. coracana" when nearly ripe.

This grass often proves a troublesome weed in "lands," and like several of the "sweet" grasses almost invariably makes its appearance where land has been ploughed or where manure has fallen. As a rule it does not exceed one foot to eighteen inches in height, and though moderately succulent becomes extremely tough when approaching maturity.

Rapoko is largely cultivated in India and is there frequently used as a hay crop; since it is also grown extensively on sandy soil by our natives, it seems likely to prove of greater value as a hay crop than E. indica, while the root development of each is very similar and depends largely on the nature of the soil on which the plant is grown—a greater development being found on sandy soils through which the roots can readily ramify.

For general purposes it seems probable that heavier yields and fodder of higher feeding value would be obtained from such crops as Boer manna (Setaria Italica), Teff grass (Eragrostis abyssinica) and Japanese millet (Panicum crus-galli), while the beneficial effect of the root system might be expected to be much the same. Experience indicates that largely on account of its fibrous root development, Boer manna, when grown in rotation or on temporarily exhausted soil, has a decidedly beneficial effect on the following maize crop, and since rapoko is apparently better suited to our more sandy soils, it would be of interest to learn whether the same results are noticeable where this crop has been grown in place of manna.

PASPALUM SCROBICULATUM, Linn.

Specimens of another grass have been received from the Lomagundi district with the information that in habit of

growth it resembles Paspalum, but that stock are not fond of it. It commences growth very early before the rains, but is only found in wet places. The plants in question were growing on a stiff black clay loam, and our informant concludes by saying that he does not consider it a valuable grass.

On examination this proved to be "Paspalum scrobiculatum," Linn., known in New South Wales as ditch grass or ditch millet. A cultivated form of the same grass is known in India as kodo, koda or kodra millet, of which the grain is used for food by the poorer natives or in times of scarcity. In Ceylon it is known as amu or waragu. "Paspalum scrobiculatum" undoubtedly resembles "Paspalum dilatatum" in some respects, but specimens collected in Southern Rhodesia are more slender in habit of growth, and on examination of the two grasses side by side, the differences are well marked.

"Paspalum scrobiculatum" is widely distributed through the tropics of both hemispheres, and is reported to be common in old lands and wet places in the Cape Colony. Medley Wood records it as common in wet ground in Natal, while Burtt-Davy, in the *Transvaal Agricultural Journal*, refers to it as frequently met with in the Transvaal, and possibly under favourable conditions of climate and moisture likely to become a troublesome weed.

Well known authorities writing on this grass state that it is valuable both for pasture and for hay, and we shall therefore be glad to learn the opinion of other Rhodesian farmers to whom it is familiar.

Church states that at times it appears to be unwholesome, cases of vertigo similar to that attributed to darnel, cheat, or drabok (Lolium temulentum) occasionally being reported as following its use as food. Maiden, however, reports that in Australia the inflorescence is very subject to ergot, and since bread made from ergotted flour is often thought to cause vertigo, it may be to this rather than to any inherent properties that its occasional injurious effects must be attributed.

H. GODFREY MUNDY.

ENTOMOLOGICAL.

NEW POTATOE SCAB (Spongospora Scabies).

During January a consignment of 386 cases of seed potatos comprising 366 cases of "Up-to-date" and 20 cases of "Northern Star," were imported by a Bulawayo firm from Messrs. Dennis, England, and were found on inspection to be infested with a species of scab very similar to the common Potato Scab (Oospora scabies), but differing from it in the form of certain of the growths on the surface of the tubers. There being no mycologist on the staff of the Rhodesian Agricultural Department, specimens were forwarded to Mr. I. B. Pole-Evans, Plant Pathologist to the Transvaal Department of Agriculture, who kindly furnished the information that all the scab on the specimens sent was due to Spongospora scabies, Mass. Although it has a strong superficial resemblance to that caused by Oospora scabies, Thaxter. So far as is at present known the disease is confined to the tubers and does not attack the foliage. 'Corky Scab' has caused a serious amount of damage to the crops in Great Britain, Ireland and Norway. It has also been found in some quantity in Germany, but it is especially prevalent in the West of Ireland. The germs of this disease infect the soil in which potatoes with 'Corky Scab' have been planted, and their vitality is such that the disease is very difficult to eradicate when it has once become established in the soil." Mr. Pole-Evans also stated that the disease had not yet been observed in South Africa and advised the destruction of the consignment.

After due consideration the Agricultural Department has decided not to destroy consignments infested with this fungus, judging that such a policy would entail hardship on the importers, and at the same time would not be an effective safeguard against the introduction of the disease.

In certain stages the scab of this disease bears such a strong resemblance to that of the common potatoe scab as to render the aid of an expert in Plant Diseases necessary to differentiate the two. As a result of this resemblance the disease would probably be frequently treated as potatoe scab, when very slightly infested consignments arrive.

It is possible that this disease has frequently been introduced into the country in the past, but was not previously recognised.

Taking into consideration the foregoing facts it may reasonably be concluded that the injury to potatoe crops threatened by the introduction of the disease is not sufficient to justify the destruction of consignments.

Under Government Notice No. 309 of 1909, consignments of potatoes infested with any disease are sorted at the expense of the consignee, and the diseased tubers destroyed. Tubers infested with "Spongospora scabies" are thus accorded similar treatment to those affected with "Oospora scabies," and confusion of the two diseases is immaterial.

A policy entailing such heavy losses to importers as the destruction of several hundreds of cases could only be justified were the danger threatened of a very grave nature, and the means available for determining the presence of the disease sufficient to form a thoroughly effective bar against its introduction. An illustration of a tuber infested with Corky Scab (Spongospora scabies), is shown.

SAWFLY LARVAE DAMAGING TURNIPS AND CABBAGES.

While paying a visit to the Hartley district in the month of February, a remarkably rapid development of the larvae of a species of saw-fly on a field of turnips was noticed. On February 11th the farmer — Mr. Sworder, of Hallingbury — was enthusiastic about the promise of his crop, which gave no appearance of being attacked by any pest, but it was noticed that a large number of saw-flies, with black head and thorax and yellow abdomen and wings, were flying about the turnips and also about some cabbage plants some distance away. On the 16th instant it was found that the outer leaves of the turnips were being devoured by a grub. The grub has much the appearance of a small caterpillar and is usually green with a yellow stripe down each side. It reaches the length of nearly three quarters of an inch when full grown. On the 17th the damage was noticeably worse, and by the 19th it looked as though the whole crop was doomed. Mr. Sworder was, however, easily persuaded to try a makeshift method of destruction, as he had at the time no spray pump on his farm. A number of boys were sent down the rows, one to each row, and as they advanced they

disturbed the leaves of the turnips with their hands, which caused the grubs to fall to the ground, where they remained quiescent. Each boy was provided with a piece of wood, something the shape of a spoon, and with this he crushed the grubs very easily and quickly. After one treatment it was found that where there had been 20 to 30 grubs before, there were now only two or three, and the plants began to rapidly outgrow the damage. Mr. Sworder later provided himself with a spray pump, and was advised to spray the plants with Lead Arsenate at 1 lb. to 25 galls. water. His last report is that the plants are doing well. The damage to the cabbages was not so noticeable, being very much obscured by that of the Cabbage Moth (Plutella sp.).

DIAMOND-BLACK CABBAGE MOTH (Pluttella sp.).

The bright green caterpillar of this tiny moth has been noticed during February and March doing serious damage to cabbages in both the Salisbury and Hartley districts. The leaves of the plants become mere skeletons in a short space of time when this pest is thriving. The greyish moths are kicked up in dozens from the plants when walking down the rows, and if one of the damaged leaves be turned over, the green caterpillars, nearly half an inch long when full grown, can be seen either feeding or hanging from a thread. The pupa is green in colour and is enclosed in a flimsy white cocoon attached to the under surface of the leaf. The cabbage is unfortunately a plant which neither lends itself very easily to the application of insecticides nor is it as a rule of sufficient value to repay the expenditure of much time or money in remedial measures. If it is very much desired to save the plants, spraying with Paraffin Emulsion is the most suitable remedy for this country.

The recipe is:—

Paraffin	...	...	2 gallons
Soft Soap	...	...	½ lb.
Water	...	...	to 30 gallons

The soap should be dissolved in a gallon of boiling water and added whilst hot to the paraffin, and the mixture churned through a spray pump for five minutes or stirred by other means for ten minutes. It can then be diluted. In spraying the endeavour should be to get the emulsion on the under sides of the leavesas much as possible.

SCALE ON CITRUS TREES.

The two commonest scales on citrus trees observed in Rhodesia up to the present are the "Brown Soft Scale" (Lecanium hesperidum) and the "Red Scale" (Aspidiotus aurantii). The former is the more conspicuous of the two, being almost invariably accompanied by the "Sooty Fungus" (Fumago), which grows on the copiously excreted honey-dew on the leaves. These scales, especially the Soft Scale, are actively producing young now in the middle of March and it is an excellent time for the application of remedial treatment. Fumigation with Hydrocyanic Acid Gas is by far the most effective method of destroying scale insects, but there are few orchards of sufficient extent in Southern Rhodesia to justify the purchase of the necessary tents. The best spray is that known as Resin Wash, prepared as follows:—

Resin	...	...	...	24 lbs.
Caustic Soda (98%)	...	...		5 lbs.
Fish Oil	...	...	...	2 bottles
Water to	...	...	...	100 galls.

Mix the soda and oil with fifteen or more gallons of water in the cooking pot and boil. Crush the resin in a mealsack and gradually stir in the powder, keeping the liquid constantly on the move and never letting any settle. Boil for ten or fifteen minutes after all this is dissolved and the mixture looks like strong coffee. If the resin is permitted to collect in a mass the preparation may take four or five times as long as it would if these directions are carefully carried out. If fish oil is not procurable, 6 lbs. of good soap may be used instead. The fish oil may be omitted altogether for Soft Scale, but not for Red Scale.

Soft soap in water in the proportions of 1 lb. to two gallons water is an effective but rather expensive substitute for Resin Wash. It is, however, more convenient if only a few trees are to be sprayed. Paraffin Emulsion, prepared as described above, may also be used, but it is not as effective as either of the preceding.

These mixtures must be applied through a spray pump fitted with a fine nozzle; a syringe is quite useless for the purpose.

RUPERT W. JACK



A Corner of the Entomologist's Laboratory.



Breeding Cages, Entomologist's Laboratory.

Farms and Farming in Rhodesia.

GOROMONZI DISTRICT.

By DR. ERIC A. NOBBS, Ph.D., B.Sc.

The district generally known as Salisbury and officially designated as the Native District of Goromonzi, consists of an irregular shaped area, bounded on the south by the Hunyani River on the east by the Inyagui, and on the north and west by the Mazoe, Poorti, and Gwibi Rivers. Containing as it does the capital, the original goal of the Pioneer Column of 1890, this district was one of the first in Mashonaland to become settled, and contains to-day a number of well developed farms. Many of these are the property of townspeople who have bought estates and are either settling on them or using them as a rural savings bank, demonstrating thereby their confidence in the agricultural soundness of Rhodesia.

In a country less essentially pastoral, the Salisbury district would probably pass as very open and with a great extent of grazing land, and such is virtually the case, but if the occupied farms only are considered an unusually high proportion will be found to be under the plough, a total, including orchards, for the season 1910 of perhaps eighteen thousand acres, or about 5.21 per centum of the land of all occupied farms.

Salisbury must therefore be regarded as an arable district and from some points of vantage a view may be had at one and the same time embracing numerous homesteads each surrounded by several hundred acres of cultivated land, the plough being gradually pushed out further and further into the open veld.

Within the Native District there are about eighty resident farmers several of whom, however, own more than one property. This brings the figure to more nearly a hundred beneficially occupied farms. Compared to other districts there are relatively few properties owned by absentees or by companies not working them. Within a short radius of Salisbury there are a number of so-called agricultural plots which in the aggregate contribute something to the import-

ance of the District, and the Commonage also is heavily stocked.

The area of the whole district is roughly 2,188 square miles or 1,400,320 acres, and of the occupied farms 543 square miles or 344,834 acres. No less than 718 square miles of the District consists of Native Reserve, while 727 square miles are not being made use of, although for the most part privately owned.

On the majority of farms it will be observed that a large proportion or the working capital is represented by cleaned and cultivated lands or takes the form of ploughs, harrows, cultivators, shellers, and other implements and appliances for dealing with maize and other crops. On many farms only a few milch cows are kept, the bulk of the live stock being draught oxen. Of course there are a number of large stock owners as well.

A recently compiled estimate of the crop gives the following approximate returns:—Maize 16,000 acres, manna 450 acres, oats 220 acres, potatoes 160 acres, tobacco 114 acres, and sundry small crops, wheat, beans, ground nuts, linseed, etc., 300 acres.

With many roads centering on the capital and the railway running into it from three directions, while a fourth line is being commenced, the district is readily traversed; a further advantage is that there are no natural obstacles to surmount. Being on the watershed of the country there are no rivers of any serious magnitude, although numerous small streams are found. For this reason, perhaps, there is not much prospect of any large irrigation works, but on several farms along the Rivers Gwibi, Umzururu, Hunyani, Umwindsi, and Umtenji, there are opportunities of excellent schemes affecting individual farms which would very materially enhance their value. Wells and boreholes seldom fail to strike water at reasonable depths, while the average rainfall taken over eleven years at Salisbury is 32.98 inches, and over a period of eight years at Chisawasha 38.99 inches, although the latter is regarded as a centre of excessive rain. Probably a thirty inch fall may be taken as common all over the district in normal seasons. The barometric mean is about 25.342 while the absolute maximum and minimum temperatures are

respectively 91° and 36° Fahrenheit, at 8 o'clock in the morning. The range of temperature may be considerable in a day, over 40° at times. The prevalent winds are from the east and south-east.

The great bulk of the soil of the Salisbury district consists either of one or the other of two types, the red loam or the granitic sand, both commonly met with throughout Rhodesia. Between these there are gradations and within them considerable differences, while other soils also occur, chocolate, black vleis, and calcareous loams. In fertility there often are great differences between adjoining farms. Generally speaking the red or chocolate is the best for maize, yielding without manure eight to ten bags — twenty-four to thirty bushels—per acre, and much more if kraal manure is applied. but between one piece of red soil and another there are remarkable differences not readily to be accounted for except by chemical analysis. On the whole the granite veld is avoided for maize growing, but some patches yield well, and in view of the greater ease with which such land is worked it is probably deserving of more attention. That "hungry" soils respond astonishingly well to manuring is notorious. From vlei soils in dry seasons very heavy crops are obtained and a portion of such land is usually found under plough every year in order to ensure some return in the event of a drought parching other lands.

The character of the veld grasses depends upon the nature of the soil and the underlying rock, the differences being very clear and readily distinguished. The greater part of the district, the north, the east, along the southern edge and at the western end, consists of granitic soil. The surface is gently undulating but runs up into fantastic granite kopjes, many of which contain the remains of Mashona strongholds and quaint rock paintings, both showing considerable skill in execution and no small degree of ability in those that made them. A feature of such country are the black vleis, sodden in summer and holding the moisture long into the dry season, for which a great future is in store when they are fully understood and the best mode of applying to them the principles of the much discussed "dry farming" has been ascertained. Meantime they serve a special purpose in that the grass springs afresh in such situations many weeks

before the rains commence, so that long before there is veld on the red soil there is good grazing on the granite. In parts this same formation is gold-bearing, but over the greater extent the farmer is undisturbed by the miner, who is yet near enough to provide a useful market without incommoding agriculture. The present maize belt of the district is confined almost entirely to this red type of soil, and most, but not all, of the European farmers are on this formation. Several farm on the granite and prefer it, and good farms like Arlington, Cardiff, Sebastopol, Twentydales, and much of Borrowdale, is on granite, and indeed there is much to be said in favour of it. For ideal farming some of both classes of soil is desirable, the red loam for crops, the sand for winter grazing and as a change of pasture, for the grass and herbs of the two classes of soil are quite distinct. This property of earliness and the springing of grass before the rains commence, constitutes the chief value of such granite land. Another feature of the veld is the occurrence of m'senas or springs, usually high up on a slope, below which a treacherous bog extends in summer and in winter damp land which holds out possibilities for the profitable cultivation of certain crops. The granite veld is that usually preferred by natives, being easy to work and suitable for the crops they grow, millets, kafir corn, beans and ground nuts. Formerly rice was largely sown, and indications of old rice gardens are frequently to be found, although the crop is now comparatively rarely grown. The scrub on the granite veld does not rise to any great height, though at times it is very dense, and serves as fuel both for the towns and for the mines.

The red soil is usually characterised by the presence of abrupt tree-clad ridges rising out of the plain and forming ranges with only narrow valleys between, as in the Enterprise district, or wide plains as around Salisbury and to the westward. The rocks found are mainly banded ironstone, schists, quartzite, and occasionally dolerite and limestone, the value of which last, for manurial purposes quite apart from its industrial use, is deserving of more attention than so far it has received.

A feature which strikes the critic somewhat is the almost total absences of fences. Save for the few miles on Borrowdale and along the railway on Lochinvar and Twentydales,

there are only a few paddocks intended rather as winter kraals than as sub-divisions of fields. No doubt as the district fills up and land becomes more valuable and stock more plentiful, fencing will become general, but already there are numerous instances in which fencing would be a wise investment as well as a sound precaution. The Fencing Ordinance enabling farmers to compel neighbours to share in the cost of joint fences has not yet been put in force in the district, a fact which is much to be deplored.

Dipping tanks are being constructed rapidly as the wisdom and benefit of this precaution are coming to be realised, and there are now nine in the district, most of which have been quite recently erected.

The dwellings of most of the farmers are of a comfortable type, and of late several quite pretentious residences have been erected, while the homesteads generally are substantially constructed and present an air of stability that is unusual in so young a country. To this rule there are however some marked exceptions. The arrangement and construction of farm buildings on Kinvarra, Stamford, Bluffhill, Pomano, Homefield, Parkridge, The Meadows, Rainham, Sunnyside and Chishawasha are models of their kind. Besides a roomy house fitted with fly proof netting on windows and doors, or stoep—one of the prime requirements—is a cattle kraal with adequate sheds to shelter the cattle during rains, with separate calf pens and a convenient paddock to turn stock into when kraaling is not needed. Stabling for mules or horses, protected with wire gauze, is also essential, as is a shed in which to keep implements and vehicles out of the sun, frost and rain, which united do more to wreck machinery and woodwork than years of fair wear. Mealie hocks and out-houses for grain and baled hay, together with workshops, a well, pigstyes, poultry yard and adequate accommodation for boys are all requisites for proper working of a farm, while silage pits, flue curing barns, and dairies are needed where special classes of farming are followed.

All the various sides of Rhodesian farming are represented in the district, maize, tobacco, dairying, stock raising, fruit growing, irrigation, and some description of these may be of general interest and instruction.

If one can speak of a maize belt in a country any part of which grows mealies without any difficulty, then Salisbury is in the heart of the maize belt, for no district grows it to greater perfection. Probably there is a larger acreage here than in any other part, while the crop has received more care and attention than elsewhere and some of the largest growers of maize are to be found within its borders. In an erratic season like the present the prospective yield is hard to calculate, but a conservative estimate, taking into consideration also the large extent of new cultivation, and based on recent personal inspection, is about 100,000 bags (203lbs.) —20,833⅓ quarters. Of the area under maize this season a considerable proportion is new land, and an even larger extent will be planted next season. The usual procedure is that land is ploughed twice and reduced to a fine seed-bed by spike and disc harrowing. It has been abundantly shewn that whether the season be wet or dry, the more thorough the preliminary cultivation the better the crop. Seed is put in with a two-row planter at distances varying with the idea of the farmer from thirty-six to forty-two inches apart and fifteen to eighteen inches between the plants. The "Hallick" weeder passed over the land when weed seed is just germinating and repeated until the mealies are fifteen inches high is good practice, but a common zig-zag toothed harrow at this stage saves a lot of work later on. Most maize lands require to be cultivated at least five times during growth, many do not get as much, a few get more. Two-row cultivators have not come much into use, but it is a common practice to span two oxen in one yoke and let each draw a single cultivator, three boys thus doing work which otherwise requires four. Broadcast sowing is never practised except when maize is grown thick for green forage or ensilage.

Maize harvesters and mechanical huskers and shredders have not yet come into vogue, but are likely some day to be taken up if labour continues to remain so shy. At present harvesting and husking is performed by hand and at leasure for mealies ripen during the dry season when no fear of rain need disturb operations. The mealie hock or corn crib is in use from May to August, and shelling goes on till about the middle or end of the latter month. Hitherto little attention has been paid to winnowing, but in future greater discrimination both in cleaning and grading will have to be shewn, especially if maize is to be exported or contracts fulfilled up

to a standard quality. The old hand sheller is in almost universal use though Mr. Kirkman, of Stamford, one of the largest growers, uses a power sheller driven by an oil engine, an example other large growers would do well to follow. In the past the practice has been to fill bags to their utmost capacity probably on account of the high cost of sacks, but it would be much better if the term bag could be depended upon as 203lbs, 200lbs for grain, 2½lbs for the sack, and ½lb for loss and drying.

The majority of farmers have from 200 to 400 acres under maize, but a few have much more; two have 700 each and one 750; on Lochinvar there are about 800 acres this season, and on Borrowdale Estates upwards of 1,500 acres all told. A few years ago a number of different varieties were in cultivation more or less experimentally and by a process of elimination and survival of the fittest these have now been reduced to three—the Hickory King, the Boone County, and the so-called Salisbury White, believed to be an adventitious cross between Hickory King and White Horsetooth. This composite type appears likely, if consistently selected and kept from further crossing, to develope a fixed character and deserve to be regarded as a distinctive sort. Combining as it does the hardyness of Hickory King with the greater cropping powers of Horsetooth maize, it appears eminently suited to those soils which can be classed neither as poor nor exceptionally rich. The standard yellow dent variety is Golden Eagle. Difficulties in the disposal of maize and great fluctuations in price led the farmers of the Salisbury district to form a Co-operative Society, which, in spite of much opposition and criticism, has steadily and rapidly gained in favour with the growers, while consumers cannot complain of any undue elevation of price but rather the reverse. Already the Farmers' Co-operative Society deals with the bulk of the crop of this and adjacent districts and is extending its operations, but without the evil tendencies of the much discussed combines and trusts of other countries. It was this Society which last year shipped a trial consignment of 10,000 bags to Europe, and should the supply justify it the same procedure may again be adopted this season with any surplus it may hold beyond local requirements.

The yield of maize in this district is high, varying from four to eighteen bags on unmanured land with perhaps six

to seven bags all over, as an average in a fair season, while on manured land up to 23 bags and even more per acre has been reported.

An observation repeatedly made by farmers, and so consistently confirmed that no doubt on the subject can remain, is the beneficial effect on subsequent mealies of a crop of manna. Instances were pointed out on several farmes where mealies following on a stand of manna last year, were strikingly taller, healthier, and yielding better than maize on adjacent land which had not been sown to manna. The immediate cause of this is not apparent and deserves study but the fact, which is the main thing, cannot be disputed, and its important bearing on the question of rotations is obvious. Linseed, on the other hand, it must be admitted, is an exhausting crop although it is a useful one on newly broken ground.

With the exception of the Melsetter district, Southern Rhodesia does but little at the present time towards supplying her own needs in the matter of wheat and wheaten products. This is partly accounted for by the scarcity of milling plants suitable for grinding wheat, but even more so by the comparatively small area of irrigable land—approximately 300 acres in the Salisbury district, of which, in addition to some naturally moist land, together with a small area under summer crop, 50 acres is devoted to wheat.

Experiments with wheat as rain crop sown in January have been conducted during the last two or three years, and in several instances favourable results have been obtained, the variety known as "Bobs" proving the most promising.

Oats also are at present grown mostly in winter and under irrigation or on naturally moist land, where springs ooze out or in damp vleis. Not much is grown therefore except by a few farmers favourably situated as Mr. Vereker on Carrickreagh, Mr. Kirkman on Stanford, Messrs. Colling and Simpson Bros. on Grange, Mr. Peacock, Learig; Mr. J. Ross, of Gletwyn; Mr. Rymer, Stuhm, and others. Oats and oat-hay are in growing demand for stable fed horses. A similar crop, but one grown in the summer, is manna, either true Boer manner on red soil or Japanese millet on black land. As yet, however, only about 450 acres are sown in the district. Seed has been a difficulty, but Mr.

J. A. Edmonds, of Glen Lorne, has taken pains to provide a clean article of good germination which commands a ready sale to all parts of the country. Tobacco is tending to become the crop of the specialist, the man who lays himself out to attend to it—for nothing is more certain than that in this branch of the farming industry it is expert knowledge that pays, and that neglect, ignorance, or carelessness, are at once followed by diminished returns and probably by losses. The type chiefly favoured is Virginian, Hester or Goldfinder seed being used, but a small quantity of Turkish leaf is also grown.

Tobacco is planted on light soil often where the red land passes over into the sand, but it is not every farm that possesses soil adapted to this somewhat exacting crop. The most notable growers are the British South African Tobacco Plantations, Ltd., on the Hunyani and Warwick Estate and Mr. Black at Stapleford, also Messrs. McChlery Bros. on Rainham, Mr. Richardson on Cardiff, the United Rhodesia Goldfields on Borrowdale, and Mr. Beck on the newly commenced plantation farm of Lorelei. The flue curing barn has been generally adopted and in view of the satisfactory prices obtained at the warehouse sale there is every liklihood of an extension of the area under this valuable crop next season, considerably beyond the 114 acres all told under tobacco this season.

Tobacco and maize are not very often grown on the same soil, they do not therefore fit into a rotation together although maize after tobacco is reported to yield good crops, and in other countries it has been found useful to grow a crop of mealies heavily dunged on land intended for tobacco the following year.

Potatoes can be grown both as a summer crop and in winter under irrigation or on naturally damp ground. There are in the district perhaps 160 acres of potatoes, mainly Early Rose, Up-to-date and Factor, and the price varies with the season from ½d. to 4d. per pound. This is one of those forms of locally grown produce which should be able to compete against importations, protected as it is by such a long line of rail, but the demand is not invariably met. Potatoes may advantageously occupy a few acres of our mealie lands, but are not at present likely to be grown on a

scale sufficiently large seriously to replace any considerable part of the maize crop.

Pumpkins are largely grown under a light crop of mealies or unmixed, and in large quantities on every farm chiefly as a succulent winter feed for cattle, but also as part of the vegetable ration for the natives on the mines.

To Mr. C. F. Browning, of Salisbury, is due the credit of introducing sugar cane, not for industrial purposes, but as a succulent feed for cows. This crop has achieved a remarkable success, yielding an enormous crop of very palatable juicy food and remaining green far into the dry season. It promises to become one of the mainstays of the dairy farmer.

Ground nuts are not as yet grown to that extent which their merits deserve and the attention of farmers on sandy soils may well be called to the desirability of cultivating this useful crop. The Chishawasha Mission has long grown the seed and expressed the oil, demonstrating in the most practical way the value of ground nuts, but apart from the Fathers there are only one or two farmers who grow the crop.

Of other crops such as beans, velvet beans, cow-pea, sweet potatoes, linseed, onions, carrots, buckwheat, paspalum and mangolds, the total acreage is insignificant although the possibilities of these crops has been shewn on a practical scale by various growers, notably of linseed by Mr. Maclaurin at Pomona, and of mangolds by Mr. Fitzgibbon at Mount Shannon.

Fruit culture has not received that attention which might have been expected in view of the presence of one of the best markets, into which fruit is poured from the Cape and from Portuguese East Africa. Citrous fruits have so far done best and there need be no doubt of their suitability. Opinion is much divided as to the superiority of grafted trees over seedlings and striking instances in favour of each is brought forward. The Rough, or Mazoe lemon stocks are advised, and of oranges the Washington Navel or Thompson's improved Navel are specially recommended, also the Jaffa, Mediterranean Sweet, and Old Cape. All kinds of Naartjes do well, also Lisbon and Villa Franca lemons. With regard to other fruits, Messrs. Maclaurin and Edmonds were recently

interrogated on the point and their recommendations seem to favour the followlng :—

Peaches : Wald-loo, Peen-loo, Pallas and Angel.
Plums : Wickson, Kelsey, Satsuma, Shire, Smoma, Ogan and Burbank.
Apricots : Alpha, Victoria and Early Cape.
Pears : Kaffyr Hybrid.
Apples : Christmas, Blenheim Orange Pippin, Cellini, King of Pippins, Lord Welsely, Roan Beauty and Versveld.
Grapes : Barbarossa, Crystal, Hanepot, Waltham Cross, Catanba ; also Quinces, Loquats and Guavas.

Of the fruit growers the largest is no doubt Mr. Maclaurin with 5,000 trees, followed by Mr. Laidlaw, of Kinvarra, with 600 and other farms like The Nursery Farm, Salisbury, Chishawasha, Glenlorne, Borrowdale, Greendale, the Meadows, and St. Marnocks, with nearly as many and a total in the district of perhaps 175,000 fruit trees of all sorts.

Mr. McIlwaine, of Salisbury, has done more than any other to stimulate the growing of citrus fruits and has demonstrated effectually the practibility and possibility of citrus culture.

The question of rotations is still in its infancy, but is already receiving practical attention and there can be little doubt but that in a few years, while maize must remain the main crop and occupy most of the arable area of each farm, yet, instead of bare, fallow or abandoned lands, we shall have a much greater variety of crops and a recognised sequence of cropping will be practised. The application of manure to land is just beginning to receive widespread attention.

Kraal manure must necessarily be the mainstay. Several farmers are wisely throwing quantities of bedding into the kraals, which absorbs the liquid manure and gets trampled down into excellent manure besides adding greatly to the health and comfort of the livestock. The practice deserves to be more widely known and followed than is yet the case. The value of leguminous crops as fertilisers has been referred to, but indeed any crop is of manurial value if the major portion is returned to the land, whether directly by ploughing in, or by grazing off, or by feeding on the farm as forage or grain. The

continual removal, whether in the form of seed, of hay, of beef and milk, or in the clouds of smoke from veld fire, is necessarily impoverishing the land continuously. On the other hand it is surprising how fertility is preserved and the yielding capacity of land maintained by judicious change of crop and occasional applications of dung.

The use of artificial fertiliser is only very exceptionally profitable at its present high price, due to our great distance from sources of supply and centres of manufacture. One valuable mineral fertiliser we have fortunately got within the district, one, too, which shows a remarkable effect when applied to our soils, which are very generally lacking in this constituent. The presence of lime in the Salisbury district, at Chishawasha and elsewhere, has hardly received that attention which its agricultural importance warrants. Fortunately it is also obtainable in quantity in the neighbouring districts of Mazoe and Lomagundi and other places in Rhodesia. Of course for agricultural purposes the price must be low, but this is compatible with production on a large scale. farmers are apt to long for the unattainable guano of the Cape, for nitrates from Chili, and for phosphates from Florida, oblivious the while of the merits of the limestone within easy reach. No doubt it is only one of the four chief elements of plant food, yet it is one which has a most marked and beneficial influence on the physical as well as the chemical properties of soils and which has a material effect in liberating the otherwise unavailable stores of nitrogen, phosphoric acid and potash in the ground. In view of the high price of artificial fertilisers it is only crops which are of high value per acre that can be properly treated with phosphates or with mixed artificial manures. Potatoes and tobacco at once suggest themselves, although the value of artificials to these crops is very apt to be exaggerated, there being no better treatment for the former than a liberal dressing of kraal manure, while a good preparation for tobacco, speaking generally, is a well manured previous crop so that the tobacco is put in on mellow land free from the presence of salts, which harmfully effect this very sensitive plant. Experience can alone guide us in the use of fertilisers and this can only be gained by several years of systematic experiment. The first and only trial of this sort yet known to us is a comparative test of several artificial fertilisers now

in progress on the farm of Mr. Laidlaw, Kinvarra, on a maize crop, the result of which, when available, should be of much interest.

Leaving now the production of crops, the next most important side of farming in the Salisbury District is probably dairy farming. This is due partly to the presence of Salisbury as a market for both milk and butter, and also to the fact that many of the cows are "improved"—crossed, that is, with European breeds—so that their milk secretion far exceeds that required for the calf, and must be utilised. Cattle are increasing rapidly in numbers and there can be no doubt but that as the quantity of milk increases, farmers here, as elsewhere, will come to regard their share of production as completed when they have separated and cooled the cream and despatched it to a common centre, a butter factory, for further manipulation. Meanwhile the dairy with its appurtenances forms an item of importance on the farm and takes up a considerable amount of time and attention. The possibilities of dairy farming on advanced lines entailing the use of silage and other succulent winter feeds, and growing winter crops, deserve attention in the Salisbury District. Butter reaches the consumer of the town and mine chiefly through the retail agent. Too frequently the churning and the working of the butter is left to unskilled hands and an inferior product results, more particularly as regards keeping qualities. In consequence it is perhaps not unnatural that complaints sometimes arise, and that Argentine and other foreign butter should be the main supply of Salisbury. Local butter often tastes very nice when fresh but rapidly sours, due largely to the presence of butter milk and to lack of scrupulous cleanliness. These are points which skill, experience and rejection by a discriminating consumer can remedy, and the simplest way to put it right is by the adoption of the method of sending separated cream to a central butter factory. The supply of fresh milk to Salisbury offers a favourable market to farmers within easy access of the town. Recently this has been organised by the formation of the "Central Dairy Company" which, at the time of writing, deals monthly with over four thousand gallons of milk in a hygienic manner, in addition to fifteen hundred pounds of butter, and has facilities for cooling and controlling this very perishable article in a manner hardly possible to the private individual.

The cattle owned by white farmers form a motley assemblage of breeds: Mashonas from all parts, Angonis, German East African, Africander, Cape, Shorthorn, Lincoln Red, Friesland, Aberdeen-Angus, Devon, Sussex, Jersey, and crosses and combinations of all these sorts. This wide variety is to be deplored as it leads to such want of similarity and to uncertainty in breeding from crosses the origin of which is so mixed. The reason of this excessive variation is partly due to the difficulties of re-stocking after rinderpest and African Coast Fever and partly to the enterprise of individuals who have brought up heifers and bulls of breeds they fancy without due regard to the circumstances to which they were being introduced and to the want of other blood of the same sort which they might use for continuing the type. Of native stock the Mashona preponderates, large numbers of late years having come up from Victoria, though not a few humped cattle from the north are also to be found. Of European breeds probably the Friesland are best represented in the district, the herd of Mr. Maclaurin at Pomona being on a par with the foremost in Cape Colony, while Mr. Kincaid Smith of Bluff Hill and Mr. MacArthur of Hillside have very good Friesland herds including several first-class individual animals. A number of farmers keep Friesland or cross-bred Friesland bulls for use amongst ordinary cows. Next to Frieslands there are a large number of Shorthorns, both Coates and Lincoln Red type, and recently several notable importations of these breeds have occurred. The principal owners are Messrs. Clayton, Ross, Gletwyn, Butchart, Homefield, and Fitzgibbon, Mount Shannon. The Shorthorn bull exerts a very strong influence on the progeny, even a little Shorthorn blood showing strongly, but this preponderence is often coupled with such refinement that, while Shorthorn blood makes its mark for several generations, too much of it is apt to lead to undue delicacy.

Professor Wallace's dictum that cattle required to rustle for themselves in Rhodesia and must never exceed one half of European parentage is very likely correct as a general statement, but possibly somewhat less than half-bred will be the limit with Shorthorn crosses, and perhaps somewhat more in the case of hardier breeds like Devons and Sussex. Of this last named breed Mr. Clayton possesses an example on his farm, the first calves by which may shortly be expected, and will be watched with much interest. A few Devon bulls and

Jerseys are to be seen, but the latter breed only commends itself when a town milk supply has to be kept up in quality and where with feeding and attention they can be adequately cared for.

The holdings in cattle vary greatly, from only twenty or thirty breeding cows up to a hundred or more on several farms and upwards of 2,000 head on Borrowdale. The total number of cattle in the Salisbury district is approximately 10,200, of which in round numbers 3,100 are oxen.

Horse sickness is very prevalent in some seasons so as to make horse breeding a very speculative venture. On farms there may be about 40 horses in all and three times that number of mules, while donkeys amount to only 160. The district is one in which the trek ox rules supreme.

The district is not adapted for small stock, although Persians and cross-bred Persian sheep do well in small flocks of not over 200, and in all there are perhaps 3,000 sheep and 550 goats in the district owned by European farmers. Most farmers keep pigs; 500 is the total reported for the district. Messrs. Edmonds and Fitzgibbon possess pure-bred Berkshires, those of the former being particularly good stock.

Every farmer has upwards of half a hundred poultry and much superior stuff has been brought up, yet in spite of 4,500 head on the farms eggs remain at a very high figure and the native fowl still rules the roost as a table bird through sheer weight of numbers, not of flesh.

Throughout the district there is manifest a prosperous and progressive tone, so that the future of farming may be looked upon as encouraging and assured.

Poultry.

By PHILIP L. HALL, Lenham Farm, Syringa.

[CONTINUED.]

Now the breeding season has commenced once more, and incubators are so much in use, a few hints upon the management of "brooders" may be of some service to readers. Many poultry keepers who do not hatch from incubators have found far better results by removing the young broods from the hens as soon as sufficiently dry, and rearing them in foster mothers by hand. This method has much to recommend it, and if proper attention be paid to the chicks they will often thrive very much better than if left with their natural mother. One of the greatest advantages is the fact that they are not so likely to attract the many kinds of small vermin such as mites, lice, etc., which multiply with such astonishing rapidity on a hen when sitting unless the very greatest care be observed. Another advantage is that the youngsters can be more regularly fed and every chick get his fill. This is not always possible when the hen has a large brood, and if a free range be given the chicks are often run off their legs through the mother's anxiety to find food for all. The dangers of being accidentally trodden upon in the nest or field are also obviated by the brooder system. In stocking a brooder there are three things to be avoided, namely, overcrowding, too many chicks in a lot, and chicks of varying ages in a lot. Brooder manufacturers are apt to over-rate the capacity of their machines to such an extent that a so-called 100-chick brooder is really only capable of rearing half that number. It may be commodious enough for the full number while they are under a week old, but a machine, the brooding chamber of which is but three feet square, is not capable of rearing one hundred chicks up to the age at which they are ready to go into cold brooders. We may be guided by makers of brooders in all other respects except this, but it would be the height of folly to place one hundred or even seventy-five chicks in a brooder which,

properly speaking, can accommodate but fifty. Better have two machines, and rear 80 or 90 per cent. of the lot. It is also a very unwise practice to try and rear a large number of chicks in one lot, no matter what capacity your brooder may be, for all kinds of young poultry thrive best in small or medium flocks, and it is much easier to rear forty or fifty in a flock than one hundred. Generally speaking, it is not usual to place chicks of different ages in one brooder; yet it is sometimes done, especially when there are some weakly ones which can make their way better if taken from their older flock and placed in the brooder with a younger lot. But there is always some danger attached to this practice, and it is not commendable, for the reason that weakly chicks are very often diseased, any may easily pass on their ailments to the healthy ones of the younger flock. It is, as a matter of fact, a mistake to keep weakly chicks in any flock, for in the end they generally come to nothing and while they are permitted to live they are merely taking up space and consuming the food that had better be given to healthy ones, with the risk always of their spreading their ailments. In the early part of the season chicks do much better with runs of moderate size than with free ranges. There is always the risk of a shower, when it becomes necessary to get them all under cover as quickly as possible, and there is great difficulty in catching them if they are permitted to wander far from the foster mother. Young chickens should always be kept in an enclosed run at all seasons until old enough to go into a cold brooder. When only three days old they may have a small run, not wider than the front of the brooder and only a few yards long; but they must be closely watched to see they do not huddle in groups outside the machine. After a day or two they will learn where to find the warm chamber, then the size of the run may be increased. It is a very simple matter to make a run of 20 ft. x 10 ft. or even larger, to be added on the end of the run attached to the brooder. Wire netting of 1-inch mesh stretched upon a light frame makes a good fence. Nothing is more important than that the brooder should be kept strictly clean, for this is the only means of guarding against both ill health and the infestation of insect vermin. It is as well to clean out thoroughly at least once a week and replace sand, earth or other litter. After a brood has been reared the machine should, if possible, get a few days' airing before a batch of newly-hatched chicks

is put into it again. First scrape the sides of the machine, then wash well with hot water and soap, adding some soda; dry thoroughly by exposure to air and sunshine, and afterwards spray with Jeyes' Fluid or any similar disinfectant. Nothing can sweeten the interior of a foster mother so well as a few days' exposure to sunshine and a strong current of air, and this is the most effective means of destroying the germs of tuberculosis and other diseases to which chicks are subject. Whilst the brooder is occupied by the chicks, also, a daily airing of the warm chamber and exposure to sunshine are most beneficial; this can be done at a time when the chicks are feeding in the run. The easiest and best way of feeding chicks in brooders is upon a variety of seeds and coarse meals given dry, with only an occasional meal of soft food, and the more exercise they can be induced to take by burying their food in light litter so that they will have to scratch for it, the better. When first removed from the incubator each chick should be given a drink by dipping its bill in water, and afterwards water should always be kept in the run—not in the heated chamber—so that it is always within reach.

In addition to the chick feed scattered in the litter, let the chicks have for their first meal a warm mash of egg and bread crumbs moistened with milk and a little fine meal. This may be fed three times a day for the first week, plenty of dry food being kept in the litter all the time. Then it may be discontinued and dry feed adopted at all times except the early morning, when boiled-whole n'youta and rapoko are very good. After the fourth or fifth day, fine meat scraps may be kept continually before the chicks in a shallow box in the run. Charcoal crushed into small size is greatly relished by the youngsters and most advantageous for their welfare. Lettuce or onions chopped fine may be either mixed with the soft food or given separately, but green food in some form is absolutely essential. Waste can easily result from overfeeding on either mash or dry feed, and the healthiest chickens are those which are fed a little at a time, at regular intervals, upon sweet, wholesome and nutritious foods.

Cookery for the Country.

By L. C.

MEAT RECIPES

BRAISED SHOULDED OF VEAL OR MUTTON.

Remove the bone and stuff with the following mixture: Some stale pieces of bread soaked and squeezed dry, a teaspoonful of salt, ⅓ of a teaspoonful of pepper, three large onions finely chopped and fried for ten minutes in a little hot dripping, a small teaspoonful of powdered thyme or mixed herbs in powder. Then melt half a cupful of butter or dripping and pour slowly over the bread, and mix all well together. Fill the cavity with this (if any is left over, make into small balls and cook round the meat for half an hour before the meat is done). On the bottom of the pan in which the meat is to be cooked spread a chopped onion, ½ cupful of chopped carrots, and two or three sprigs of parsley, all sprinkled with salt and pepper. Lay on this the meat, pour round it a pint, or three cupfuls, of stock (made from the bones), cover and cook in a moderate oven for three to four hours. Uncover about 40 minutes at the last to get brown. Slightly thicken the gravy with browned flour.

BULLY BEEF RISSOLES WITH SWEET POTATOES.

Boil and mash some sweet potatoes, add slowly to two cupfuls of the mashed potatoes, beating all the time over the fire, one cupful of hot milk, a tablespoonful of butter, ¼ teaspoonful of pepper, a teaspoonful of salt, and lastly three well-beaten eggs. Butter a plain mould (a basin of a suitable size will do), sprinkle over as many fine bread crumbs as will stick to the butter, shake out the rest, turn in the potatoe mixture, cover with a piece of greased paper, stand the mould in a saucepan of boiling water (the water must not reach more than halfway up), or better still, in the top of a steamer saucepan, and bake or steam for half an hour. Turn out in the centre of a hot dish. While this is cooking, put through the mincing machine 1 lb. of beef. Mix with this ½lb. of fine breadcrumbs, ¼lb. of dripping, salt, and a good dash of pepper, and bind the whole with one egg well beaten. Make

the mixture into small rolls, dip first in flour, then in beaten egg, and lastly, in fine dry breadcrumbs, and fry in boiling fat until a nice brown. Dish round the potatoe mould, standing up against it, with sprigs of fried parsley on top and around.

EGG DISHES

EGG LOAF.

Butter a pint mould, and decorate with cold boiled peas and boiled carrots cut into fancy shapes. Make a sauce with one teaspoonful of butter, one of flour, and a cupful of chicken stock or of milk, and season well with salt and pepper. When nearly cool add four well-beaten eggs, a tablespoonful of chopped parsley, a third of a teaspoonful of onion juice, and four hard boiled eggs chopped up. Mix the whole together and pour carefully into the mould so as not to disturb the decoration. Stand in a pan of hot water in the oven, and bake for 40 minutes, or until firm in the centre. Turn out carefully and serve with tomato sauce.

SAVORY TOAST.
(A Good Breakfast Dish).

Cut some bacon, fat and lean, into slices, fry over a hot fire with a good sprinkling of parsley, one or two spring onions chopped fine, and some pepper and salt. When sufficiently cooked or nearly so, add a couple of beaten-up eggs, stir the whole well for a few minutes, and serve on slices of fried bread.

VEGETARIAN DISHES

CAULIFLOWER MOULD.

Boil a medium-sized cauliflower with, if liked, some of the green, but it is a more delicate dish without the green. Drain and cut up small, adding salt and pepper to taste and a tiny pinch of nutmeg. Beat two eggs up with ¼ pint of new milk and mix into the cauliflower alternately with a good tablespoonful of fine white breadcrumbs. Put into a well-buttered basin or pie dish, sprinkle with a few more breadcrumbs and little pieces of butter over the top, and bake slowly until quite set and nicely browned.

TOMATOES IN BATTER.

Scald and peel four good sized fresh tomatoes, cut them in halves and arrange them in a well-greased baking dish with the cut side uppermost. Sprinkle with pepper and salt, and, if liked, a little chopped parsley, and place on each half-tomato, a small knob of butter. Then pour gently round a batter made with two tablespoonfuls of flour, half pint of milk, two eggs, and half an ounce of melted butter, and bake the whole in a hot oven for half an hour.

Preservation of Butter.

The following letter was sent direct to an enquirer, but may be of interest to others similarly situated :—

In reply to your enquiry I beg to give you details for potting butter for winter use :—

To make butter for potting or for keeping for winter use, the cream must on no account be over-ripe and churning should be carried on at a low temperature, as near 56° Fahrenheit as possible.

The butter should be well washed while in the grain in the usual way and then brined with brine at the rate of two pounds of salt per gallon of water. After it has been drained in the butter worker for two or three hours, dry salt is still in the grain, using ¾ of an ounce to the pound of butter and work it over twice or perhaps three times. Leave the butter in a cool place for a few hours, then work it over again to remove any remaining moisture which the salt will have drawn out.

Pack it carefully in very thoroughly cleaned wooden boxes lined with grease proof paper or in clean earthenware vessels, stamped down so that no air spaces whatever are left in the corners or between the layers of butter, for it is chiefly by the exclusion of air that rancidity is prevented. Fill the jar to within a couple of inches of the top, cover it with a piece of muslin and a layer of salt or with a well boiled strong brine made the previous day, cover to exclude dust and stand in a cool, dry room.

Butter treated in this way should keep in perfect condition for several months.

E. A. N.

Reviews.

A REPORT ON CERTAIN WORK AND EXPERIMENTS ON THE MATOPOS AND INYANGA ESTATES.

As is well known to the public, Mr. Rhodes, in his now historic Will, left his landed property near Bulawayo and Inyanga upon Trust for the instruction of the people of Rhodesia, together with £6,000 a year for preserving and beautifying the Matopos Park, and for "such things as experimental farming, irrigation and any of those things, and establishing and maintaining an Agricultural College."

In accordance with these directions experiments and farming operations have been carried out on behalf of the Rhodes Trustees, and in January, 1908, Mr. J. G. McDonald of Bulawayo issued a brochure dealing with the experience gained on the two estates at that time. We now welcome a further statement of experimental work conducted on the different farms belonging to the RhodesTrust.

The first topic dealt with is fruit growing, being a reprint of what Mr. McDonald has already published in his "Hints to South African Farmers" with a few additional notes at the end. This chapter is followed by a reprint of some remarks by Mr. Primrose McConnell on soils and on English crops suited to certain soils.

Mr. E. A. Hull contributes an account of experiments carried out on the Matopos Estate, the chief interest in which centres round the success which has followed the trials of lucerne on black vlei soils under irrigation. After several years of trial Mr. Hull reports that he has adopted a plan which appears to be entirely successful. He states:—

"While the experiments were being conducted a lucerne cultivator was invented, which, as far as this country is concerned, will practically revolutionise lucerne growing. I say this country, because the natural grasses of the country are so strong that without proper cultivation we find that in two or three years they crush out the lucerne. By broadcasting fairly thick in February or March, when the weeds do not trouble quite so much, a good stand is procured, and by the time the weeds make their appearance the following summer the lucerne is strong enough to stand the cultivator, which digs up all the weeds with surface roots and leaves the lucerne unimpaired."

"Two really first rate fields were set last February and March, and the results from these have been most satisfactory. Moreover, I find that some of the worst soil on the farm for cereals has grown the best lucerne, provided enough water is given to the young crop. This soil, which is called sour land, chiefly owing to its being water-logged, seems to improve immensely when lucerne is sown on it."

Unfortunately the name of the cultivator in question is not given in the report but we may venture to guess that it is Robert's implement, manufactured by Messrs. Mangold Bros. of Port Elizabeth, which took the prize at the great Cradock trials that are referred to.

Mr. Hull also expresses himself strongly on the subject of veld burning. We cannot do better than quote his interesting remarks:—

"It is an acknowledged fact that grazing improves the veld. Why? Because of the droppings cattle leave distributed all over the grazing ground. These droppings get very dry in winter, and, if the grass is burnt, they, being very inflammable, catch fire and are burnt to ashes. These ashes, as well as those from the grass, are blown away by the first wind, and the veld is left bare to bake hard under the blazing sun. The rains come in due course, and the water, falling on the dry sun-baked soil, runs off as it would on a cement floor. The young grass comes up but is promptly scorched off by the sun again."

"If on the other hand the veld is left and not burnt, you will find that under each pat of dung the white ants have been busy working the dung into the land, and when the rains come, out of each pat a useful sweet grass will spring, of good feed value. Whether the origin of this grass is due to the ants cultivating the soil or to the fact that the sweet grass seed has been deposited in the dung, I am not in a position to say; but the fact remains the same, viz., that a grass quite different to the ordinary sour veld grass is introduced."

"Burning of grass must take place to get rid of the hard fibrous stalks of the coarser grasses, but this should be done after the veld is thoroughly wet and the fine leaves of the grass have been washed down and mixed with the soil and all the cattle droppings are thoroughly wet. If a fine day in December or January is chosen for this work, the refuse grass can be got rid of without harming in any way the good grasses. Moreover, a new growth of grass starting

in December or January is found to keep greener through the winter months and cattle will feed it quite bare. Even the natives have recognised the wonderful improvement in the veld on this farm since this custom was instituted."

Regarding cattle Mr. Hull gives the following cogent advice:—

"1st: Keep your cattle clean and free from ticks by constant dipping. Blood is life and every drop taken from a beast by a tick has to be made up again somehow. While there is plenty of pasture the effects of the ticks are not so noticeable as in the winter months when the veld is bad, and when a drain of this sort is very often sufficient to kill a beast which would otherwise have done well."

"2nd: It is necessary to make provision for stock during the bad months of the year by cutting hay and growing mangels during the rainy months. A farmer who allows a beast to die of poverty in a grass country like this, is a poor specimen of the profession."

"3rd: Calves should not be allowed to get a set-back if you wish them to mature early. It is a good plan to run cows and calves together during the day, and only milk once in 24 hours—in the morning."

"Autumn and winter are the best calving times. Calves born then are healthier, and the cows go through the winter better suckling a calf than carrying it."

A report on the work carried out on Inyanga Farms during the past two years is furnished by Mr. F. E. Wienholt.

The farm, he states, is not suited for mealie growing but crops have been successfully raised under irrigation of potatoes, carrots for stock, barley, lucerne; and, as summer crops, rye and oats; while mangels, turnips and pumpkins failed. We note here that the writer refers to pickling oat seed with bluestone as a preventative of rust as well as smut. Surely this is an oversight, but a serious one in that farmers reading it may be tempted to adopt this process, which, effectual as it certainly is for the latter disease, is, of course, of no avail against the former.

The name of the Inyanga Estate has always been associated with efforts to introduce Merino sheep to the highlands of our eastern border. There are now 2,000 Merinos on the farm and Mr. Weinholt is a great believer in the Bert Bowker cure for wireworm.

Of various grasses tried cocksfoot and sheep's burnet are recommended.

Trees of all sorts seem to thrive in the climate of the mountains and the orchard continues to do well, apples particularly so, indeed this seems to be the most satisfactory item of all.

Mr. Weinholt's experience and advice regarding horses is well worth following, he says:

"A young stallion and five mares were imported during the winter of 1908, from Cape Colony. Unfortunately horse-sickness accounted for two of the mares this year, a third succumbed to snake bite, a fourth becoming incurably lame was given away. Two mares already at Inyanga now have nice foals running at foot, and a yearling saved from one of the dead mares is also doing well. I am afraid, however, that horse breeding at a profit in Rhodesia is a long way off yet."

Mr. W. E. Dowsett, the Curator of the Rhodes' Matopo Park, contributes notes on Forestry and experimental tree planting, bringing up to date and amplifying much of what he has previously published on this interesting subject. Notes on over 130 forest trees which have been tried are given and these will be studied with interest by all interested in tree planting for very rightly the failures as well as the successes have been recorded, while the peculiar requirements of each sort has been given. Comments follow on a number of fruit trees but unfortunately names of varieties which have answered well are not given. Indigenous trees have been tried, sown direct in the open, as they have been found not to bear transplanting well.

Some account is given of the experience of other farmers on the Matopos Estate.

Following the main chapters we have some interesting notes on some common poisonous herbs, a table of railway rates of farming implements from the coast to Bulawayo, fencing, ensilage.

Throughout this little book, which is well got up and neatly bound, there are useful hints and suggestive remarks with much of which we are disposed to agree and to the more important of which we have alluded above.

E.A.N.

DISEASES OF THE HORSE.

We have received a copy of the second edition of the late Mr. D. Hutcheon's book on "Diseases of the Horse," Edited

and revised by Mr. W. Jowett, F.R.C.V.S., D.V.H., (Liverpool).

It is now seventeen years since the first edition appeared, this however has been out of print for some time, and the repeated enquiries for the work has resulted in the issue of the present edition.

It is unnecessary to attempt an extended review of anything from the pen of the late Mr. Hutcheon. He was one of the soundest Veterinarians of the 19th century, a keen observer of animals in health and disease, and his works are regarded with respect and authority by the Veterinary profession in the English speaking world, and the whole pastoral community of South Africa.

The sections dealing with the "Administration of medicine to the Horse" and the "Dieting of Sick Horses" contain in simple and concise language what every owner of horseflesh should know, and they can be read with profit by those who think they have nothing to learn about what is generally but erroneously regarded as the simplest of matters pertaining to the management of horses on the sick list.

Under the heading of "Specific Diseases" the following are dealt with:—Horsesickness, Biliary Fever, Anthrax, Glanders, Epizootice Lymphangitis, Strangles, Tetanus, and Pyaemia of Foals. Several of these plagues have in the past caused considerable loss in Rhodesia, and although we are comparatively free from them at present, the intelligent reader of this section will be reminded that such scourges do exist in Africa, and may be introduced into Rhodesia at any time.

A description of the causes, symptoms, and treatment of General Diseases, diseases of all the organs of the body, Castration, Wounds, Diseases of Bones, Lameness and Diseases of the Feet, comprise the main body of the work. All are briefly and plainly described, and the principles of treatment described can be confidently followed where Veterinary assistance is unobtainable.

Mr. Jowett is to be congratulated on the manner in which he has performed the work of revision, especially in the section dealing with "Specific Diseases," and we would suggest to him that a collection of Mr. Hutcheon's works on "Cattle Diseases" would be equally acceptable.

The book is obtainable from the Controller of Printing, Castle Street, Cape Town. Price four shillings.

J.M.S.

Dates of Meetings of Farmers' Associations, Southern Rhodesia

(SUBJECT TO ALTERATION).

Name of Association.	Place of Meeting.	Secretary.	1910.								
			Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Mashonaland	Salisbury ...	W. H. Williamson ...	2	7	4	2	6	3	1	5	3
Rhodesia Landowners' ...											
Farmers'	Bulawayo ...	Harry Hopkins ...	28	26	30	28	25	29	27	24	29
Manica	Umtali	P. B. Snashall ...	2	7	4	2	6	3	1	5	3
Midlands	Gwelo	M. L. Price ...	8	6	10	...	...	...	...	...	...
Lomagundi	Eldorado Mine ...	J. J. Reynard ...	9	14	11	9	13	10	8	12	10
Makoni	Rusapi	F. A. Lapham ...	13	11	8	13	10	14	12	9	14
Marandellas	Marandellas ...	A. J. H. Nicholson ...	2	...	4	...	6	...	1	...	3
Matopos	Matopos... ...	W. E. Dowsett ...	...	...	5	...	...	4	...	...	4
Plumtree	Plumtree ...	J. Reid-Rowland ...	7	...	...	7	...	...	6	...	...
Victoria (Eastern)	Good Hope Farm	F. A. Readman ...	...	7	...	...	6	...	...	5	...
Enkledoorn	Enkeldoorn ...	A. J. Liebenberg ...	30	28	25	30	27	24	29	26	31
Figtree	Figtree	J. T. Kirschbaum ...	9	...	...	9	...	...	8	...	...
Melsetter	Melsetter ...	H. A. Oxenham ...	1	...	...	1	...	...	7	...	...
Gazaland	Chipinga ...	A. L. Sclater ...	...	5	...	...	4	...	...	3	...
Hartley	Hartley	S. J. Knutzen ...	9	7	11	9	6	10	8	5	10
Mazoe	Mazoe	V. W. Fynn ...	...	...	5	...	...	4	...	...	4
*Makwiro and Norton ...	Makwiro ...	W. Shaw ...	...	...	...	...	...	...	...	...	...
*Macheke	Macheke ...	A. C. Fountain ...	...	...	...	...	...	...	...	...	...
*Victoria	Victoria	James Rutherford ...	...	...	...	...	...	...	...	...	...
*Kimberley Reefs ...	Kimberley Reefs ...	G. O. Smith ...	...	...	...	...	...	...	...	...	...

Dates of Meetings of Associations marked (*) are uncertain.

Correspondence.

SOIL TREATMENT.

THE EDITOR RHODESIAN AGRICULTURAL JOURNAL.

Dear Sir,

I lately had a letter from a farmer friend containing this phrase, "The old land is harder than ever, the new is a treat in comparison." I wonder if this is the general experience of Rhodesian farmers when ploughing? It is, in a short experience, mine. The reasons I take it are not far to seek. The ground is trampled by natives when reaping and by the cattle and wagons. The stalks are left in the ground and fed by cattle and more trampling ensues. Old land has, unlike new land, no protection from the sun or late rains in the shape of vegetation, and the result is "hard bake." It would seem to me that some form of stalk cutting is necessary so that the stalks may be cut with the stumps, ridden off and the ground disced or ploughed as soon as possible after reaping. It is true that this entails a loss of manure directly applied by the cattle when feeding in the lands, but feeding the stalks and using them as litter in the kraals would make a valuable manure. Then comes the method of returning this to the lands. The ordinary method of shovelling into a wagon and scattering it by hand is a very expensive one and labour is not always available. An easy method of loading might be with a dam scoop running up on to the wagon on a slide and pulled by oxen by a rope. What is wanted as a distributor is a machine that could be attached to an ordinary ox wagon, the cost of a manure distributor for this purpose alone being too heavy for the small farmer.

I take it another reason old lands are so difficult to bring to a good tilth is the constant loss of humus. If the manure is spread on the surface of the lands say once a week, a considerable acreage could be fertilised every year, and humus added to the soil. As against this advantage is the resulting weed crop, but by careful ploughing and harrowing these should not be an unmixed evil, as ploughed in they contribute humus.

One is often recommended to plough in the grass when breaking new land. This is an excellent advice if the grass and weeds are green and therefore easily decomposed, but when the grass is already dry and it is almost impossible to break down the root clumps, they entail endless trouble when planting, the planter riding over the roots and grass and leaving the seed on the surface. Harrowing after sowing is almost impossible as much of the maize is planted in these clumps which are dragged out by the harrow, and much of the seed is on the other hand buried beneath the clumps. I venture to warn beginners like myself against this practice. It is better to burn off the grass, great as is the loss of humus and manure.

I trust that these few lines may result in those with experience giving us of their knowledge. For instance in mixed farming, how many beasts can manure an acre, i.e., from the kraal manure. What is the result of various forms of green manuring, and can crops for this be successfully grown as catch crops planted say in February. Is there a pattern of stalk cutter cutting the roots below the ground? What is the effect on stalk borers of riding off the stalks? Is discing sufficient to leave the land in a good state for spring ploughing or must the ground be ploughed in the autumn? Is there any advantage in breaking new ground in using a mouldboard as against an efficient disc plough?

Yours, etc.,

"CLODHOPPER."

In regard to the foregoing remarks it may be pointed out that in addition to the causes enumerated by "Clodhopper," the heavy tropical rains which are experienced each season are no insignificant factor in the packing of arable ground, and though it would doubtless be advantageous to spread manure as our correspondent indicates, the loss due to drying out and blowing away by winter winds would probably be considerable.

In the British Isles it is estimated that animals kept in open yards and littered down fairly liberally produce about 6 to 8 tons of dung per head in the six winter months. Probably under similar conditions in South Africa about half this amount might be expected from animals kraaled during the night.

We do not know of any machine for cutting maize stalks under the ground, though such an implement would doubtless be a great saving of labour where the ravages of the stalk borer are apprehended. On these and other points raised, the views of Rhodesian farmers would be of much interest and value, and it is hoped that readers will give us their experience as to green manuring, the relative merits of discing versus ploughing and mould-boards as against disc ploughs in breaking new ground.

H.G.M.

MORE POTATOES.

THE EDITOR RHODESIAN AGRICULTURAL JOURNAL.

Dear Sir,

I note in the Journal Mr. Wienholt had a marvellous quantity of potatoes at one root but he does not give the weight of same. I don't think he is likely to be beaten either for quantity or weight presumably. I had one root of "Up-to-Dates"—a volunteer (left in ground from previous crop)—which had only ten potatoes attached, 3 of which weighed over one and a half pounds each and the total ten weighed slightly over seven pounds, all perfectly formed and sound.

Can any of the Journal readers beat this in eggs. Seven inches in girth and longitudinally 8¼ inches containing 3 yokes, from a White Leghorn. I wish someone could tell me how to perpetuate the strain, Mr. Editor!

I am, etc.,

R.W.T.

CULTIVATION OF MEALIES AND OTHER MATTERS.

THE EDITOR, RHODESIAN AGRICULTURAL JOURNAL.

Dear Sir,—With reference to your correspondent's queries re double row mealie cultivators, etc., perhaps an account of my experience may be of interest. I have used a Ransome, Sims and Jeffries, machine on about 150 acres of mealies this season with excellent results. This machine, as supplied, has four sharp triangular tines to work on either side of the central row of mealies, and an additional tine can be attach-

ed to centre of machine when working cross-over land. I used ox traction, and as the planter had been similarly drawn the rows occasionally show the wavy condition your correspondent mentions. Owing to this I found it advisable to remove the two inner tines which were doing considerable damage. With steady mules I do not think this would be necessary and of course the work would be better. With this slight alteration I have used the machine constantly. It pulverises the ground beautifully and lifts the weeds and grass right on to the surface. The single row machines do not do anything like such good work, in fact with the troublesome water grass I found them practically useless, simply sliding over it. The double machine, on the contrary, having flat triangular tines on curved arms, lifts grass and weeds most thoroughly. The machine is strong and light. I used it up to the 26th February when I cultivated mealies planted on the 31st December. The axle is rather low, a fault which I have reported and which I believe will be corrected. The novice is apt to be rather alarmed at the apparent damage when passing over tall plants. However those laid low but not broken will recover in the night. Of course when the mealies are very tall a certain number are broken, but the gain to the crop outweighs this slight loss. Our mealies have suffered very little from the four weeks drought in January and I attribute this to constant cultivation. In my opinion this is not a machine to be worked by boys. The sharp tines running close to the rows can do a lot of damage if carelessly worked. When the mealies are small the oxen are inclined to swing about, but when the crop is taller they keep the line without trouble. Steady oxen and a good leader are necessary, and the oxen can be guided by voice or whip from the seat. When set at the depth necessary to thorough cultivation the draught is rather heavy for two oxen, and I found it impossible to use more on wavy rows. However by changing the team at mid-day the cattle did not suffer.

These machines may be had at Messrs. Meikle Bros. store.

Allow me to heartily endorse your editorial remarks on your correspondent's query re cutting mealie stalks. I have no experience of mealie harvesters though we hope to get one this season. Last year on coming to the country I ex-

perimented with the mealie crop by cutting down about 15 acres of mealies close to the ground while the leaves were still green and stalks juicy, though the grain was hard. These I placed in shocks in the land leaning them on either side of a pole supported by two forked sticks to allow the air to circulate. The shocks were larger than I should make again and I felt rather anxious for some time on account of white ants and because of the unusually late rains. However I found that althougl the ants had worked in to some shocks they did not tackle the grain, and although a few cobs looked mouldy on the sheath the grain did not suffer. By this means we were able to plough the land while still fairly damp, and we had a large supply of excellent fodder which together with hay and ensilage kept our cattle, including working oxen in good condition throughout the winter. On taking off the cobs, the stalk and leaves were put in one large stack and they remained green and succulent to a remarkable degree. The cattle preferred this fodder to hay. Your correspondent seems to doubt the economy of cutting and shocking by hand but when one considers the points on which you lay stress, early ploughing and mitigation of grub pests, and adds to them the gain of good fodder in place of the usual land of dry stalks, I think the game is well worth the candle. Especially so to a farmer who would in any case go the "good deal of labour entailed in gathering to be destroyed by fire." No doubt a machine would be more economical, but where a farmer cannot afford one let him try cutting by hand, or still better by the apparently simple method recommended by "H.G.M.," which I would like to try. The good farmer will clean his lands in any case, so the question is whether he will undertake the labour when the stalks are dry and worthless, or whether he will cut early, have his lands in good condition for the plough, and secure a supply of good fodder, eventually to return in the form of manure

If I may trespass still further on your space, allow me to suggest that your already excellent Journal would be still more helpful to those of us who are newcomers were your experienced readers a little more communicative. Even the doubts and experiences of the new chum are often useful in the remarks they elicit.

Yours etc.,

J. M. DAVIDSON.

POULTRY.

THE EDITOR, RHODESIAN AGRICULTURAL JOURNAL.

Dear Sir,—I have read with interest your articles on Poultry appearing in the "Rhodesian Agricultural Journal," and shall feel obliged for your advice on the following points:—

1st.—Do you approve of dipping fowls to keep down fleas and lice.

2nd.—I am troubled with small black fleas (sand fleas) which congregate about the eyes and heads of the fowls.

3rd.—What do you recommend for white flat lice in chickens? I use Keating's and soon after applying the lice come up to the surface, do you recommend a better remedy?

Hoping you will excuse my troubling you.

I am, etc.,

THOS. POWER.

ANSWER.

Query No. 1.—All fowls will derive great benefit from occasional dipping in a weak solution of McDougall's Dip in warm water. The feathers should be gently turned the reverse way whilst the bird is immersed in order that the fluid may soak through to the skin. Care must be exercised to prevent the birds from catching cold afterwards. The best method is to dip at one time only sufficient number that can be conveniently placed in a coup before the kitchen fire.

Query No. 2.—The small black fleas can be easily got rid of, they attach themselves only to the head. Mix either a small portion of lard or butter with a little paraffin oil and apply thickly to the parts affected, examine again in a few days but a second application is seldom necessary.

Query No. 3.—Keating's Powder may be mixed with double the quantity of flowers of sulphur, this, while having the same effect on the lice, will be found more economical and should be well rubbed in just prior to dipping, the effect will be that the lice are brought to the surface and the more easily accounted for by the dipping.

P.L.H.

Garden Calendar.

By N. L. KAYE-EDDIE.

FLOWER GARDEN.

Most flowers which have bloomed during the summer months now gradually cease flowering and the beds will require well working up before winter flowering plants are put in. Carnations require attention and should be kept free of old blooms and the ground around the stems kept free and loose. If the ground has been well manured or mulched this will greatly assist in keeping in the moisture during the cold dry months which follow, and it must not be forgotten that constant stirring of the surface is also advantageous to this end.

Cuttings may be planted from most perennials and shrubs. Hard wood cuttings are best taken when it is seen that the sap is down, and should be kept warm and moist, care being taken in watering to give just sufficient moisture, as an excess tends to rot the cutting, especially if there is much organic matter in the soil used.

VEGETABLE GARDEN.

Potatoes which have matured during these months may generally remain in the soil and lifted as required.

Vegetables planted out for winter crops should be well and continuously cultivated, which will help to bring them along quicker with less watering. Late bearing tomatoes should be sheltered from the cold winds by a grass shield. Beans should be staked and tied.

Market Reports.

The reports received to date indicate that London Market prices for grain remain nominally unchanged with a tendency of the quotations hardening slightly. The local market has been well supplied with cereals during the past month.

The following are the latest market quotations received :—

Jas. Lawrence & Co., Ltd. Kimberley, 18th March, 1910 :—

Bran, per bag 100 lbs ...	6/0	6/6	Potatoes, new	5/0	13/0
Barley, per bag 163 lbs ...	9/6	12/6	Tobacco, good, per lb ...	4d	7d
Beans, Sugar, bag 203 lbs	28/6	30/6	Tobacco, inferior, per lb	1d	2d
Beans, Kafir, 203 lbs ...	8/6	10/0	Wheat, per bag 203 lbs ...	18/6	20/0
Chaff, Colonial, bale ...	6/6	9/6	Butter, fresh, per lb ...	8d	10d
Chaff, Colonial, pressed, 100 lbs	3/0	3/6	Butter, second quality ...	5d	7d
Forage, good, per 100 lbs	5/3	5/9	Eggs, per dozen	9d	1/2
Kafir Corn, S.A., mixed	4/6	7/0	Ducks, each	2/0	2/3
Kafir Corn, White ...	4/6	7/0	Fowls, each	1/0	1/6
Boer Meal, Colonial, unsifted	23/6	26/6	Turkeys, each	4/0	9/0
Boer Meal, Colonial, sifted	26/6	30/6	Salt, per bag	3/0	4/0
Flour, Colonial, per bag 100 lbs	15/6	16/6	Dried Peaches, per lb. ...	2d	4d
Yellow Mealies, Colonial, 203 lbs.	8/0	9/0	Dried Apricots, per lb. ...	2d	4d
White Mealies, Colonial, hard, 203 lbs	7/6	8/6	Lime, per bag	2/6	3/6
White Mealie Meal, 183 lbs	9/3	10/0	Apples, per box	2/0	6/6
Oats, per bag 150 lbs ...	9/6	10/6	Pineapples, per dozen ...	0/4	0/6
Lucerne Hay, per 100 lbs	4/3	5/0	Grapes, per box	1/0	6/6
Onions, per bag 120 lbs...	3/6	7/6	Grapes, per basket ...	3/6	8/0
			Peaches, per box... ...	1/6	3/6
			Peaches, per basket ...	3/0	8/6
			Water Melons, per doz...	6/0	20/0
			Beans, green, per lot ...	4d	6d
			Cabbages, per dozen ...	1/0	3/6

LIVESTOCK.

Oxen, good, prime, 600 lbs upwards	£6/10	£9	Hamels, 40 lb to 45 lb ...	8/0	12/0
Cows, good, 450 lbs upwards	£4/10	£6	Cape Sheep, good ...	10/0	12/6
Calves, per lb dead weight		4d	Kapaters, good	10/0	12/6
Pigs, 100 lbs (clean), per lb live weight	3d	3¼d	Oxen, Trex	£5	£6/10
Lambs, 30 lb	6/6	8/6	Riding Horses	£10	£25
			Draught Horses	£10	£22/10
			Mares	£9	£20

Jas. Lawrence & Co. (Transvaal), Ltd., 24th March, 1910 :—

Barley, per 150 lbs. ...	11/6	14/0	Peas, per 200 lbs. ...	11/6	13/6
Beans, per 200 lbs. ...	12/6	35/0	Potatoes, per 150 lbs. ...	3/0	13/0
Bran, per 100 lbs. ...	6/0	7/3	Rye, per 200 lbs.... ...	11/6	13/3
Chaff, per 100 lbs. ...	2/6	3/3	Salt, per 200 lbs.... ...	5/0	5/3
Forage (T'vaal), 100 lbs.	5/0	6/9	Boer Meal, sifted, per 200 lbs.	25/0	28/6
„ (O.R.C.) „	2/0	5/6	Wheat, per 200 lbs. ...	13/0	20/6
„ (Colonial) „	6/6	6/9	Butter, per lb.	7d	10d
Hay, per bale	6d	9d	Eggs, per dozen	1/6	1/9
Kaffir Corn, White, per 200 lbs.	5/3	6/0	Ducks, each	1/6	2/3
do. Mixed	5/6	7/3	Fowls, each	1/0	2/3
Lucerne, per 100 lbs. ...	3/6	5/0	Geese, each	4/0	4/9
Manna, per 100 lbs. ...	2/0	3/6	Turkeys, each	3/6	13/6
Mealies, (S.A.), White, per 200 lbs.	6/9	8/1	Pigeons, each	6d	7d
Mealies, (S.A.), Yellow, per 200 lbs.	8/9	9/3	Slaughter Oxen ...	£8/10	£12/10
Oats, per 150 lbs. ...	5/6	11/6	Sheep, per lb., dressed weight	4¼d	4½d
Onions, per 120 lbs. ...	4/6	7/6	Pigs, per lb.	2½d	4d

Hubert Morisse & Co., Johannesburg, 24th March, 1910:—

Barley, per 163 lbs ...	11/0	14/3
Bran, per 100 lbs, Colonial	6/0	6/8
Chaff, best, 100 lbs ...	1/6	3/0
Eggs, per doz, Colonial...	1/6	1/9
Salt, per bag	5/0	5/6
Forage, Transvaal 100lbs	6/0	6/9
„ Colonial, 100lbs ...	6/6	6/9
„ med. & inferior „	2/0	4/6
S. Meal, best fine, 203lbs	25/6	28/6
Rye... „	12/0	13/6
Wheat „	12/6	20/6
Mealies, Hickory King	8/6	8/6
Mealies, O.R.C. Whites...	7/6	7/10
Mealies, Yellow	9/0	9/4
Kafir Corn, per 203 lbs ...	5/4	7/3
Hay, Sweet, Transvaal...	9d	1/0
Lucerne, per 100 lbs ...	4/0	5/3
Manna ... „ ...	2/0	3/0
Transvaal Hay, bale ...	4d	9d
Oats, per 153 lbs... ...	6/9	11/6
Potatoes, best, per 153 lbs	8/9	11/0
„ med. and inferior	2/6	8/0
Onions, Cape, 120 lbs ...	5/9	7/0
Turkeys, Cocks	6/0	15/0
„ Hens	3/6	4/9
Fowls	1/0	2/9
Ducks	1/4	2/6
Geese	4/3	4/9
Pigeons	7d	8d
Butter, O.R.C.	7d	10d
Pumpkins, each	3d	6d
Beans, per 203 lbs, Sound	13/6	36/6

LIVESTOCK.

Slaughter Oxen	£9/10	£13
Slaughter Cows	£6	£8
Milch Cows, Cape ...	£19	£30
Trek Oxen	£7	£8/10
Tollies	£4	£4/10
Sheep, Cape and Bastard	per lb	4d
„ „ ...	14/0	18/6
Sheep, Merino, per lb ...		4d
„	14/6	19/6
Slaughter Ewes	9/6	12/6
Lambs	8/0	11/6
Goats, Boer Kapaters ...	13/6	19/6
Pigs, live weight	2¾d	4d
Mules, large	£20	£26
Mules, medium	£16	£17/10
Mules, small	£13	£15
Horses, good	£16	£25
Horses, ponies	£9	£13
Donkeys	£5	£6/15
Heifers, 12 to 18 months	£5	£6
Heifers, 2 to 3 years ...	£6	£7/10
Cows, breeding	£7	£8/10

Whitfield & Co., Salisbury, 8th April 1910.—

Cows, good milkers ...	£25	£35
Cows, Native	£9	£10
Heifers, Colonial	£7	£8
Heifers, Native	£5	£6
Trained Oxen, large ...	£12/10	£14
Trained Oxen, ordinary ...		£10
Mules, inoculated	£28	£32
Mules, not inoculated ...		£25
Horses	£25	£30
Donkeys, Colonial... ...	£8	£10
Donkeys, G.E. African ...	£7	£8
Sheep, Colonial		25/-

Wightman & Co., Ltd., Salisbury, 8th April, 1910:—

Mealies, per 203 lbs ...	10/6	11/0
Rapoko, per 203 lbs ...	10/0	11/6
Oat Forage, per 100lbs...	8/0	10/0
Onions, per lb	2½d	3d
Potatoes, per lb	¾d	1¼d
Munga, per 203lbs ...	11/0	12/0
Salt, per 200lbs	18/0	19/0
Manna Hay, per 100lbs ...	7/0	8/0

Rainfall Registered.

	Year ended 31st December, 1909.		Agricultural Year ended 30th June, 1909	
	Total Rainfall.	Total No. of Days Rain fell.	Total Rainfall.	Total No. of Days Rain fell.
MASHONALAND—				
Borrowdale	31.93	74	44.12	83
Charter (Range)	26.44	90	26.85	84
Chishawasha	30.83	96	34.62	92
Chilimanzi	26.19	60	27.17	64
Driefontein	22.83	94	...	...
Enkeldoorn	22.27	77	26.45	83
Eagle's Nest	28.40	89	...	...
Gatooma	39.40	73	38.05	69
Gutu	28.53	77	25.89	74
Helvetia, South Melsetter ...	82.31	172	73.76	196
Inyanga (B.S.A.P.)	36.95	80	34.79	78
Marendella	28.41	63	27.80	57
Melsetter	45.48	91	51.78	103
Mt. Darwin	22.30	70	36.47	75
M'Rewa	26.52	71	30·87	75
Monte Cassino (Macheke) ...	29.78	75	29.90	64
Mazoe (South)	27.63	85	32.26	94
Rusapi	18.94	67	28.31	83
Salisbury	30.21	89	38.10	94
Sinoia	21.99	77	31.16	84
Sipolio	19.40	64	22.24	62
Stapleford	27.93	69	...	...
Summerfield, Penhalanga ...	45.77	130	...	...
Umtali	25.94	76	32.53	69
Utopia	26.35	...	28.35	94
Victoria	16.54	64	...	...
West Ridge	29.66	74	...	...
York Farm, Inyanga	43.70	117	40.54	111
MATABELELAND—				
Belingwe	32.71	76	33.14	81
Bulawayo	32.66	89	32.43	92
Empandeni	27.37	59	28.73	60
Filabusi	32.34	69	28.39	63
Fort Rixon	20.56	70	19.19	74
Gwanda	25.54	80	25.26	74
Gwelo	26.95	101	27.99	96
Hope Fountain	33.57	96	31.82	97
Matopo Mission	36.20	79	33.76	89
Plumtree	22.18	69	31.86	69
Que Que	29.41	73	37.13	73
Rhodes Matopo Park	26.53	65	22.16	62
Kariyangwe	33.05	76	...	...
Selukwe	38.93	110	45.14	95
Tegwani	22.38	53	29.39	62
Tuli	13.71	...	10.15	...
Umgusa	35.08	62	30.64	59
Umshabetsi Mission	22.36	66	25.13	62

The mean rainfall for the year ended 31st December, 1909, is 30.80 inches, with 84 rainy days in Mashonaland and 28.41 inches with 76 rainy days in Matabeleland.

The average rainfall for the Agricultural Year ended 30th June, 1909, is 34.78 inches, with 85 rainy days in Mashonaland and 28.95 inches with 75 rainy days in Matabeleland; and compared with the previous year shews an increase of 2.35 and 6.07 inches respectively.

The maximum rainfall for the months during the year ended 31st December, 1909, is recorded as follows:—

January	Matopo Mission	17.82 inches.
February	Helvetia	18.11 ,,
March	,,	12.46 ,,
April	,,	5.49 ,,
May	Que Que	3.55 ,,
June	Helvetia	1.23 ,,
July	,,	1.26 ,,
August	,,	1.19 ,,
September	,,	0.93 ,,
October	York Farm	3.60 ,,
November	Salisbury	5.83 ,,
December	Helvetia	19.67 ,,

The greatest amount of rainfall in 24 hours during each month in the order given above is reported as follows:—

Empandeni, 5.21 inches; Helvetia, 3.57; Victoria Falls, 5.42; Helvetia, 2.28; Mount Darwin, 1.25; Belingwe, .60; York Farm, .41; Helvetia, 1.01; Helvetia, .88; Syringa, 2.75; Salisbury (West Ridge) 1.84; and Helvetia, 5.82.

The precipitation of 5.82 inches, between 8 p.m. on the 25th and 1 a.m. on the 26th December, is the heaviest known in Southern Rhodesia, and is described by the Observer as a terrific storm, which occasioned much damage to water furrows and mealie lands, and caused rivers to rise above previous highest flood levels; many banana and gum trees were struck by lightning.

The rainfall for the first half year was above the average, while that for the remainder of the year was below.

A few stations report hail storms during the month of October. At Syringa, where some of the hail storms are stated to have been the size of hen eggs, fruit and gardens suffered considerably, and at Melsetter several tobacco crops were ruined.

Weather Bureau.

Mean Temperatures recorded during the year ended 31st December, 1909.

	Mean Max.	Mean Min.	Mean Monthly Temp'ture.	Absolute Max.	Absolute Min.	Variations in Temperature		
						Great'st Daily Range	Mean Daily Range	Least Daily Range
Bulawayo	77.4	53.9	65.6	95.2	37.5	40.8	23.5	4.2
Chishawasha (1) ...	78.6	52.3	65.4	93.4	37.0	43.1	26.3	8.3
Empandeni	80.0	52.9	66.5	98.5	32.0	46.0	27.1	1.2
Gwelo	77.5	51.1	64.3	96.3	32.1	44.7	26.4	5.7
Hope Fountain (2)...	76.4	53.5	64.9	96.8	36.2	41.0	22.9	2.9
Melsetter	72.3	...	...	92.2	...	...	...	...
Plumtree (3) ...	76.6	55.1	65.8	94.8	40.9	34.1	21.5	6.1
Salisbury	76.7	53.4	65.0	93.8	25.0	39.0	23.3	5 8
Umtali (4)	81.0	37.4	59.2	94.2	25.0	59.5	43.6	30.5
Belingwe (5) ...	78.5	54.7	66.6	101.0	34.0	46.0	23.8	5.5
Gwanda	80.2	55.2	67.7	101.0	33.9	43.2	25.0	3.5
Rhodes Matopo Park	77.4	54.3	65.8	95.0	33.0	47.0	23.1	1.0
Selukwe	76.1	54.4	65.2	96.0	41.3	36.0	21.7	3.6
Victoria	79.6	54.6	67.1	98.8	33.0	49.5	25.0	1.7
Inyanga (York Farm	71.7	47.8	59.7	86.0	34.0	39.7	23.9	2.0

(1) 323 Days' Observations
(2) 360 „ „
(3) 345 „ „
(4) 350 Days' Observation
(5) 272 „ „
(6) 318 „ „

Temperatures Recorded, 1910. (Means).

	January.		February.	
	Max.	Min.	Max.	Min.
Bulawayo	80.6	59.9	78.9	61.1
Chishawasha	84.1	57.6	78.9	60.1
Empandeni	84.6	60.9	83.5	61.6
Gwelo	82.1	56.3	78.6	59.0
Hope Fountain	80.5	57.0	78.6	60.5
Melsetter	74.3	...	74.0	...
Plumtree	78.2	60.7	...	...
Salisbury	80.5	58.3	77.7	59.4
Umtali	87.7	45.3	81.5	41.5
Belingwe	84.3	62.0	80.0	63.2
Gwanda	85.1	63.5	82.6	62.7
Rhodes Matopo Park ...	84.1	60.1	80.3	61.4
Selukwe	...	...	...	...
Tuli	87.0	...	88.0	...
Victoria	81.2	60.9	81.4	62.3
York Farm, Inyanga ...	73.7	52.8	72.0	54.5
Victoria Falls	88.2	65.6	84.7	65.4

Records received of Rainfall at Stations in Southern Rhodesia, 1910.

	January	February
MASHONALAND—		
Brundret, Mazoe	4.75	4.53
Battlefields		
Banket Junction	5.16	5.99
Borrowdale	4.31	3.38
Charter (Range)	1.74	6.05
Chilimanzi	1.84	6.29
Chishawasha	4.93	3.42
Eldorado	4.75	8.79
Enkeldoorn	3.03	6.21
Eagles Nest	1.56	4.71
Gadxema		
Gatooma	1.66	8.32
Gutu	0.57	7.90
Hartley	2.98	11.80
Helvetia	13.73	16.31
Inyanga (B.S.A.P.)	4.05	9.56
Inyanga (York Farm)	6.60	7.62
Marendella	2.16	7.36
Monte Cassino	4.11	7.48
Macheke	2.24	7.74
Mount Darwin	4.07	4.72
M'Rewa	4.88	5.93
Melsetter	4.42	13.23
Mazoe South	6.11	5.62
M'Toko	1.12	4.98
Progress Farm, Marandella ...		
Rusapi	3.60	8.95
Salisbury	3.30	3.66
Sinoia	5.56	8.79
Sipolilo	5.51	7.64
Stapleford	3.65	5.52
Summerfield, Penhalanga ...	2.61	7.47
Utopia	1.58	5.30
Umtali	2.38	4.61
Victoria	1.56	4.96
West Ridge	2.88	4.78

RECORDS OF RAINFALL.—*Continued.*

	January	February
MATABELELAND—		
Balla Balla	.55	5.10
Bembezi	3.39	4.35
Bulawayo (Observatory) ...	2.28	3.22
Bulawayo (Govt. House) ...	2.44	1.55
Belingwe	1.96	5.35
Driefontein	1.53	5.20
Empandini	1.24	1.63
Filabusi	2.75	5.63
Fort Rixon	.62	6.71
Gwelo	.88	7.19
Gwanda	.94	3.82
Gwaai	1.93	5.44
Heaney Junction	1.68	2.53
Hope Fountain	1.71	4.64
Inyati	3.62	5.50
Insiza	.71	7.98
Kariangwe	5.72	3.86
Malindi	4.21	6.89
Matopo Mission	1.44	9.02
Nyama Ndhlovu	3.48	5.51
Plumtree	1.18	
Que Que	1.95	6.62
Rhodes Matopo Park	1.35	4.27
Selukwe		9.89
Syringa	3.45	2.22
Tegwani	3.32	3.60
Tuli	2.40	2.25
Umguza	1.92	3.19
Umshabetsi Mission	.48	3.85
Victoria Falls	3.11	7.50
West Nicholson	.97	3.67
Wankies	1.32	6.00

Observers' Notes.

GWELO (January).—The dry weather experienced during the month has had a detrimental effect on the mealie crops, and some have wilted to such an extent that it is doubtful whether they will recover.

UMTALI (January).—Crops, owing to scarcity of rain, are not quite as good as last year.

February—Crops good.

MAZOE (January). — The young mealies on the high ground have grown very yellow. Unless heavy rains fall in February and March the mealie crops in the district will be very poor.

February.—The good rains in the early part of the month brought on well the mealie crops which had been planted late in the season. Provided a few inches of rain fall early in April some of the mealie crops will be very fair.

ENKELDOORN (February).—The crops are beginning to recover, the result of the good rains during the end of January and the commencement of February.

EAGLES NEST (January).—The lack of seasonable rain is getting serious.

February.—Crops are below the average of previous years and the yield will be less per acre than last year.

FORT RIXON (January).—The worst season since 1905. Mealie crops are very poor for want of rain, and on some farms the crops will not recover. Stock is doing well and there has been no disease except liver sickness in calves, but it is not so severe as last year.

February.—Rain came just in time to save some of the crops. Stock is in good health and condition.

MONTE CASSINO (January).—The month has again been rather dry, mealie and other crops suffering to some extent. Mealies in deep vlei land doing well. Native crops in the more sandy soil looking rather poor.

MOUNT DARWIN (January).—The crops are fair. No disease in stock, which is doing well.

February.—Crops are now doing well. All stock improving in condition.

M'REWA (February).—Crops good notwithstanding shortage of rain, but rivers very low, much lower than they were at the beginning of the rainy season. Unless we get late rains there will be great scarcity of water for stock and winter irrigation.

MATOPO MISSION (January).—Crops are much in need of more rain. Mealies are flowering small. Kaffir Corn is small and turning yellow.

February.—The general appearance of the country has changed very much during the month. Crops have much improved, but will be light. Stock is doing well.

SUMMERFIELD, PENHALANGA (February)—Crops, although late, are looking well. Stock is in good condition.

UMGUSA (January). — Crops suffering from drought, especially native crops, most of which are in a bad way.

GUTU (February).—Timely rains have come, and now it can be said that all danger of a shortage of grain is over.

Veterinary Report for the Months of January and February, 1910.

JANUARY.

SALISBURY.

No contagious diseases reported.

BULAWAYO.

No contagious diseases reported.

Four horses and seventeen mules were tested with mallein on importation, and found healthy.

UMTALI.

AFRICAN COAST FEVER.—Fresh outbreaks: None.

Existing outbreaks: On the 1st of the month all the sick cattle, 22 in number, were destroyed. During the month 21 head of healthy cattle were slaughtered for food and 57 were destroyed as showing high temperatures, leaving a balance of 43 head in the Temperature Camp.

CALF DISEASES.—Several cases of redwater, complicated with a muco-enteritis occurred in two dairy herds;

five animals were treated with trypan bleu, four of which recovered. The Government Veterinary Surgeon is of opinion that this drug promises to be useful in such cases.

Three calves belonging to one owner died on the Umtali Commonage. Post mortem showed that the cause of the deaths was inflammation of the stomach and bowels.

SCAB.—Three flocks released, two remain under quarantine.

HARTLEY.

The deaths of seven oxen from fly disease were reported. All these oxen, and also all others at present showing symptoms of fly disease, have been working on the Eiffel Flats or on the road between Gatooma and the Suri Suri, with the exception of one lot near Gatooma. It is suspected, however, that these strayed over to the Eiffel Flats shortly after arrival at Gatooma.

VICTORIA AND SELUKWE.

Several suspected cases of rabies reported.

No contagious diseases reported from any of the other districts.

FEBRUARY.

SALISBURY.

No contagious disease.

BULAWAYO.

No contagious disease.

The following animals were tested with mallein on importation and found healthy :—

Horses ...	...	...	1
Mules ...	...	...	6
Donkeys	...	...	35

UMTALI.

AFRICAN COAST FEVER.—Existing outbreaks: As considerably over a year has elapsed since the last case of

disease on the Raheen-quaggas Hoek centre, some susceptible cattle were placed on the area to test whether free from infection or not.

Fresh outbreaks: An outbreak occurred amongst a herd of 130 head of cattle on Plots 10 and 11, Imbeza Valley. To end of month 9 deaths had occurred and 21 were showing symptoms of disease.

SCAB.—Five flocks remain under licence.

GENERAL.—A large number of cases of sickness amongst cattle was reported during the month, and except the outbreak of Coast Fever at the Imbeza plots, the cause was in all cases found to be natural or accidental.

MELSETTER.

Several cases of sickness were reported amongst cattle imported from Sabi District. Repeated inspection has failed to find anything but redwater or vegetable poisoning.

HARTLEY.

No contagious diseases.
One ox reported dead from trypanosomiasis.
One horse from horsesickness.

MARANDELLAS.

AFRICAN COAST FEVER.—A further outbreak occurred amongst Mr. Finch's cattle on the Rusawi Outspan. This herd had been under careful observation as one beast had died eight months previously, and the cause was undoubtedly African Coast Fever. As soon as the re-appearance of the disease was confirmed, all the animals in the herd were destroyed.

SELUKWE.

One outbreak of rabies occurred.

BELINGWE.

A suspected case of rabies occurred.

No contagious diseases reported from any of the other districts.

J. M. SINCLAIR,
Chief Veterinary Surgeon.

Agricultural Reports.

DECEMBER, 1909, JANUARY, 1910.

MASHONALAND.—Throughout Mashonaland the deficient rainfall caused considerable anxiety during December and January. On the eastern borders and to the north-east, though dry, conditions were fair, but very gloomy throughout Darwin, Kanyemba, Lomagundi, and most serious in Charter, Chilimanzi, Gutu and Ndanga. In several districts the veld was actually scarce in these months, a most unprecedented state of affairs, while the first sowings failed. It is reported from several districts that while mealies failed, and rukweza rapoko suffered, nyouti munga or pearl millet resisted the drought very much better. Late rains came to save the situation but a diminished native crop is a certainty, and scarcity in parts, though on the whole there should be enough for native requirements. The early rains were very partial and there was considerable anxiety at one time regarding farmers' crops. In some cases these will be diminished, but late rains came as a rule in time and the prospects improved immensely, so that there is now every reason to anticipate a plentiful supply of mealies, and in view of the extended acreage, a considerable increase over last year. European crops suffered less than those of natives owing to the thorough cultivation of the crops which is now universally practised.

Locusts have virtually disappeared for the time being. Perhaps the dry season is in some measure the cause. The common stork of Europe, our large locust bird, is very plentiful and apparently finds ample feeding amongst our frogs and grasshoppers in the absence of the voetgangers.

The obligations incumbent on natives to respect the timber resources of the country have been clearly demonstrated to the inhabitants of the Victoria district, where forty have been prosecuted for the destruction of trees. It is to be hoped that this step will have a widespread effect, for the damage done in this respect is as permanent as it is widespread and frequent.

On all hands the signs of progress and development are the order of the day, but labour is as scarce as ever.

MATABELELAND.—Similar conditions to those described above obtained throughout Matabeleland. Wankies, Sebungwe and Belingwe report drought though no serious prospect of want. The crops have failed in the Mopani veld of the Matobo district and the want of rain was severely felt in Insiza. Generally the season was late and dry and the crops consequently backward, but latterly the prospects improved considerably, and while perhaps yields will on the whole be below the average, the outlook is not serious, and the late rains which fell have put quite another complexion on matters.

The extension of the use of the plough continues to be a feature amongst the Matabele though no similar headway is made amongst the Mashonas.

Departmental Notices.

THE ANALYSIS OF AGRICULTURAL PRODUCTS, SOILS, WATER, ETC.

SCALE OF CHARGES.

Arrangements have now been made for the chemical examination of soils, grain, and other produce, oil-seeds milk, water, fertilisers, etc., on behalf of farmers and others by the Chemist attached to the Department of Agriculture. The charges made, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

SCHEDULE OF CHARGES.

	£	s.	d.
1. Partial analysis of a manure or feeding stuff, for each constituent...	0	5	0
2. Complete analysis and valuation of a manure or feeding stuff	1	0	0
3. Analysis of Agricultural products, e.g., grain, hay, roots, etc.	1	0	0
4. Analysis of water for Agricultural purposes irrigation or drainage	1	5	0
5. Partial analysis of soil to determine fertility and recommendations as to manurial treatment	2	0	0
6. Complete analysis of a soil	3	0	0
7. Milk—determination of total fat and solids ...	0	5	0
do. do. of fat only	0	2	6
do. complete analysis	0	10	0
8. Cream—determination of fat only ...	0	2	6
do. complete analysis	0	10	0
9. Analysis of Cheese	0	10	0
10. Limestone—Estimation of % of Lime ...	0	5	0
do. complete analysis	1	0	0

Remittances should accompany samples submitted.

No charge will be made where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest,

DIRECTIONS FOR TAKING SAMPLES OF SOILS.

It is recommended to select four or five spots at least, per acre: taking care that these represent as far as possible the general character of the soil of the field. If the soil of the area to be reported upon presents notable differences the samples gathered from the different parts must be kept separate.

Having selected a proper spot, pull up the plants growing upon it and remove surface accumulations of decaying leaves, etc, if any. Dig a hole about twelve inches deep and trim one side so as to be smooth and vertical; from the side so prepared remove with the aid of a sharp spade a slice of uniform thickness—about three or four inches—down to a depth of nine inches. Place the slice on a clean board or cloth and mix thoroughly with similar slices obtained in the same way from other parts of the field area. About six pounds of the mixture are then placed in a clean cloth bag or wooden box. Forward with the sample the following particulars:—

Date of collection, exact location, position (hillside, vlei or flat), peculiarities of soil and sub-soil, behaviour in wet and dry seasons, crops borne, previous manurial treatment, and every circumstance in fact which will throw light on its agricultural qualities.

DIRECTIONS FOR TAKING SAMPLES OF GRAINS, PRODUCE AND FEEDING STUFFS.

Grains, meal and feeding stuffs and all agricultural produce should be sampled in the same manner as prescribed for fertilisers.

When the feeding stuff is in the state of cake, select not less than three cakes where the quantity does not exceed one ton, not less than five cakes when the quantity does not exceed five tons, and not less than ten cakes when the quantity exceeds five tons.

Break the selected cakes into small pieces, mix them together, and take the sample—not less than one pound—from the mixture.

DIRECTIONS FOR TAKING SAMPLES OF FERTILISERS.

If delivered in bags, select not less than two bags when the quantity does not exceed one ton; and one additional bag for every additional ton,

In no case need more than ten bags be selected.

Empty the selected bags separately on to a clean wooden or stone floor. Thoroughly mix the contents, and set aside one spadeful from each bag, mig together the separate spadefuls and from the mixture take about one pound as a sample.

If the fertiliser is in bulk, mix together portions taken from the different parts, and draw the sample from the mixture.

DIRECTIONS FOR TAKING SAMPLES OF WATER.

All samples should be sent in glass bottles. Stoneware jars are to be avoided. The bottles should preferably be provided with glass stoppers; if corks are used, they must be new and well washed previously in pure water.

In sampling a stream or tank, before taking the samples rinse out the bottle several times with water, taking care to avoid the introduction of mud or sediment.

Before taking a sample of water from a pipe, allow the water to run through it for a few minutes at full pressure.

In all cases, before the sample is taken, always rinse out the bottle several times with the water to be sampled.

Quantity to be taken: 1 gallon.

DIRECTIONS FOR TAKING SAMPLES OF MILK AND CREAM FOR BUTTER-FAT DETERMINATIONS.

The bulk from which the sample is to be drawn should be first poured two or three times from one vessel to another, and about half-a-pint forwarded for examination.

If it is impossible to deliver the sample in a fresh condition, introduce into each sample bottle about as much of the following preservatives as can be held upon a three-penny piece:—Borax, Boric Acid or Salicylic Acid; stating which preservative has been used.

All bottles used must have been previously cleansed with boiling water.

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, etc.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

SAMPLES SENT TO THE DEPARTMENT OF AGRICULTURE.

Parcels are constantly being received for one purpose or another addressed to this Department, very often without any indication of where they came from or why they were sent, and it is difficult in such cases to trace the sender.

It is earnestly requested that farmers and others will mark distinctly on the packages their names and addresses so as to enable their requirements to be attended to without delay.

CO-OPERATIVE EXPERIMENTS.

The Department of Agriculture has stocked the following seeds for distribution this season under the usual terms of Co-operative Experiments. Farmers anxious to test crops on a small scale before sowing more largely, are invited to send in their applications as soon as possible. The distribution is limited, and not more than three to five sorts can be sent to each applicant. The amount sent to any one farmer will depend on the number of applications received, but in any case, sufficient seed will be forthcoming to give the crops a fair trial.

Seed is issued f.o.r. Salisbury, but farmers are expected to pay railway carriage. When the Agricultural Parcels Post Regulations are applicable this means of forwarding will be used as being cheaper and more rapid. Under these terms the seed is issued, on condition that the farmer co-operating supplies at the end of the season a true report on the result of the experiment on forms supplied for that purpose.

Applications should be addressed to the Agriculturist, and as far as possible, will be dealt with in the order in which they are received.

As an extension of the work carried out last season, the Department is arranging to stock the following winter cereal crops: Wheat, Oats, Barley, Rye, and it is anticipated that the undermentioned varieties will be available for distribution during and after the month of March.

Wheat	Bobs Rust Proof	suitable for moderately good land.
	Gluyas Early	
	Klein Koren	for rich land.
	Golden Ball	likely to succeed on moist soil without irrigation.
Oats	Cape Oats (true Boer haver)	only suitable for rich land
	Algerian Oats	a somewhat later variety and suited to poorer soils
	Sidonian Oats	Worth trial on moist land without irrigation
	New Zealand Oats	

Nepal Barley or Barley Wheat.
Chevalier (two-rowed Barley) for malting purposes.
Rye, winter—for sandy soils or on moist land without irrigation, or under irrigation.
Early Rye—for green fodder.

Supplies of seed are limited and applications should therefore be made early to the Agriculturist, Department of Agriculture, Salisbury.

SALE OF PASPALUM GRASS.

Slips of this valuable winter grass, for moist situations, are obtainable on application to the Director of Agriculture, Salisbury, packed in bags and f.o.r. Salisbury Station, at the rate of 5/- per 1,000. Good measure is given, and remittance must accompany all orders.

MULBERRY CUTTINGS.

Mulberry Cuttings, f.o.r. Salisbury, 5/- per 100. Apply, to the Agriculturist.

TOBACCO SEED.

All enquiries for tobacco seed should in future be addressed to The Manager, Rhodesia Tobacco Warehouse, at Salisbury or Bulawayo.

TOBACCO SEED BED COVERING.

A large supply of calico for covering tobacco seed is now available. It can be obtained from the Anglo-African Trading Company at Salisbury, Bulawayo and Gwelo.

Price, 2½d. per square yard.

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transactions.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particulars regarding the habits of the plant, will be welcomed, and in return the Department will supply all available information regarding the plants.

DESTRUCTION OF WILD CARNIVORA, ETC.

It is hereby notified for public information that the rewards for the destruction of wild carnivora, etc., will be paid only on the scale and conditions herein set forth :

2. Rewards will be paid as follows :—

For each Lion	£3	0 0
„ Leopard	1	0 0
„ Cheetah	1	0 0
„ Wild Dog	0	10 0
„ Crocodile, of not less than 3ft. in length	0	10 0

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, and to natives by the Native Commissioner of the district, within three months of the date upon which the animal is killed, on a prescribed declaration form.

4. In proof of destruction, applicants for rewards will be required to produce and surrender, in the case of the Lion, Leopard or Cheetah, the skin with the tail not severed, and in the case of the Crocodile or Wild Dog, the unskinned head.

5. The skins and heads of animals for which rewards have been paid shall be the property of the Government, and shall be disposed of in such manner as may be decided on.

PURCHASE OF STUD STOCK BY GOVERNMENT ON BEHALF OF FARMERS.

Arrangements have been made whereby farmers may purchase pure bred stud stock through the Department of Agriculture.

Besides securing the benefit of the most competent judges to select the animals, whether in South Africa, England or Europe, purchasers are enabled to make payments by instalments spread over a period of one year.

For full particulars application should be addressed to the Director of Agriculture, Salisbury.

LOANS FOR FENCING.

The B.S.A Company is prepared to advance funds to any owner of a farm beneficially occupied by a white person, to provide fencing material, on the following conditions:—

1. Half the cost of the material at nearest station or siding will be advanced, in no case exceeding the sum of £150.

2. Payment shall be made in ten equal annual instalments or less if the applicant desires, together with interest at 5 per cent. per annum, payable in July, but no repayment will be called for within one year of granting the loan.
3. The applicant will be required to pass a first mortgage bond over his farm as security for the loan, *or* to furnish personal security to the satisfaction of the Board.

The loan will be made on completion of fence, and subject to inspection by a representative of the Company. The fence may be erected to any pattern approved by the Board, but for guidance the following minimum requirements will nominally be insisted upon :—

Straining posts not farther than 440 yards apart; standards not farther than 60 feet apart; droppers or lacing not farther than 4 yards apart; if no droppers are used standards should not be more than 20 feet apart. If wooden strainers, standards or droppers are proposed to be used, the kind is to be specified.

Applications stating the situation and mileage, and furnishing specifications of fence proposed to be erected, and accompanied by firm and detailed quotations for the material required and cost at nearest station, must be addressed in the first instance to the Director of Agriculture, Salisbury. Applicants should state whether internal or boundary fences are to be erected.

Preference will be given to farmers in areas which have adopted Part I. of the "Fencing Ordinance, 1904," and to boundary fences, but all applications will be considered.

Farmers are invited to submit applications for the consideration of the Fencing Board to the Director of Agriculture, Salisbury.

DEPARTMENTAL BULLETINS.

The following Bulletins on special subjects, consisting mainly of reprints of articles which have appeared in the Rhodesian Agricultural Journal, are available for distribution free of charge to applicants in Rhodesia :—

African Coast Fever, by Ll. E. W. Bevan, M.R.C.V.S.

Terms of Analysis of Agricultural Products, Soils, Water, etc., (compiled).

Bots in Equines, by R. Ferguson Stirling, M.R.C.V.S.
Broomcorn, by H. Godfrey Mundy.
Cotton Cultivation, by J. L. Stinson.
"Foul Brood" in Bees, by Rupert W. Jack, F.E.S.
Fencing Ordinance, 1904, (compiled).
Farm Science, by J. E. Wing and others.
Government Aid in Fencing, (compiled).
The Ground-nut or Pea-nut, by H. Godfrey Mundy.
Interim Report on the Animal Trypanosomiases of Southern Rhodesia, by Ll. E. W. Bevan, M.R.C.V.S.
Importation of Plants, etc., Regulations, by Rupert W. Jack, F.E.S.
Maize Growing, by H. Godfrey Mundy.
Malaria, by A. M. Fleming, C.M.G., M.B., F.R.C.S. (Ed.), D.Ph. (Camb.).
Prevention and Treatment of Blackwater Fever, by A. M. Fleming, C.M.G., M.B., F.R.C.S. (Ed.), D.Ph. (Camb.).
The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., L.L.B.
The Potato Tuber Moth, by Rupert W. Jack, F.E.S.
Special Rates for the Benefit of the Farming Community in Southern Rhodesia, (compiled).
Tobacco, by G. M. Odlum.
The Tsetse Fly, by Ll. E. W. Bevan, M.R.C.V.S.
The Time and How to Find it, by Rev. Father Goetz, S.J.
Winter Feeding of Farm Stock, by H. Godfrey Mundy.
Wireworm or Hairworm in Melsetter District, by E. M. Jarvis, M.R.C.V.S.
Flax, Linum usitatissimum, by C. E. F. Allen.

DIPPING TANKS: GRANTS IN AID.

The Government will make grants in aid for the purpose of constructing dipping tanks, to approved applicants.

Grants will only be made after the tank has been inspected and approved by the Director of Agriculture or an official deputed by him.

Grants will be made on the £ for £ principle, but the amount paid in any case will not exceed £50.

Applications should be made to the Director of Agriculture, from whom further particulars can be obtained.

Editorial Notices.

The "Journal" is issued bi-monthly, and the subscription is 5s. per annum, payable in advance. All communications relating thereto should be addressed to the Director of Agriculture, Agricultural Department, Salisbury, and if an answer is required in the pages of the "Journal," should reach this office not later than the 15th of the month preceding publication. Subscribers are requested to notify immediately the non-delivery of the "Journal."

TO ADVERTISERS.—Application for space in the "Rhodesian Agricultural Journal," should be addressed to the Director of Agriculture, Salisbury. The rates are as follows, per issue :—

Position.	Whole Page. £ s. d.	Half Page. £ s. d.	Quarter Page. £ s. d.
Inner Pages	2 0 0	1 5 0	0 15 0
Outer Cover (back) ...	4 0 0	—	—
Inner Covers (back and front) and page facing Contents	3 0 0	1 15 0	1 0 0

A discount of 10 per cent. will be allowed for standing or consecutive advertisements running through six issues. Remittances, and electros where desired, should accompany orders. The right is reserved to discontinue the insertion of standing or consecutive advertisements should payment beyond the second issue be delayed.

The right of approval of all advertisements by the Director of Agriculture is reserved and his decision as to the acceptance or rejection is final.

An additional charge may be made for advertisements printed in special type, equal to any additional charges made by the printers for setting up same.

Advertisements will be accepted from bona fide farmers wishing to effect sale, purchase or exchange of produce, live stock, or farm implements, at a minimum charge of 2s. 6d. per insertion of 20 words. Extra words will be charged for at the rate of 1s. for every 10 words,

Government Notices.

No. 223 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 30th September, 1909.

IT is hereby notified for public information that His Honour the Acting Administrator has been pleased to approve of the temporary appointment of James Woodin, Esquire, to be examiner of Stock for the purpose of granting permits for the introduction of Livestock into Southern Rhodesia.

By command of His Honour the Acting Administrator.

P. D. L. FYNN,
For Treasurer.

No. 211 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 16th September, 1909.

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—

Grass	Straw
Hay	Lucerne Hay
Forage	Green Lucerne
Sugar Cane	

or any other bedding or fodder plant.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,
For Treasurer.

No. 295 of 1908.
Department of Agriculture,
Administrator's Office,
Salisbury, 1st October, 1908.

IMPORTATION OF STOCK.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 8, of the 19th day of January, 1905, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries enumerated is prohibited, owing to the existence or supposed ex-

istenco of destructive diseases affecting the said animals in the said countries:—

(1) All animals from the Island of Mauritius.

(2) All animals from German South-West Africa and all animals except donkeys from German East Africa.

(3) Pigs from the colonies of the Cape of Good Hope, Transvaal and the Orange River Colony, the Bechuanaland Protectorate, the Tati Concession, and other countries in which swine fever exists, subject, however, to the exceptions contained in the proviso to this section.

(4) Dogs from the territories of North-Eastern and North-Western Rhodesia and Portuguese East Africa; provided, however, that dogs from countries from which importation is permitted may be introduced through the port of Beira and brought direct into this Territory.

(5) Sheep and goats from (a) the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingswilliamstown, Komgha, Peddie, Somerset East, Stockenstroom, Uitenhage, and Victoria East, in the Cape Colony; (b) the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterburg, and Zoutpansberg, in the Transvaal; (c) Swaziland; (d) Portuguese Territory; (e) places north of the Zambesi River.

Provided, however, that the Controller of Stock may at his discretion permit the importation of pigs under six months of age for breeding purposes from the places mentioned in sub-section (3), and sheep and goats from the places mentioned in sub-section (5) hereof, on production of a certificate of a duly authorised Government veterinary officer that such animals are free from disease, have not been in contact with diseased animals, and have not come from an area where destructive disease has existed for twelve months previously.

2. The importation of organic manures, except guano, is strictly prohibited, and the importation of bone meal and bones required for fertilising or feeding purposes will only be permitted when accompanied by the certificate of a responsible and competent person that they have been thoroughly disinfected by treatment by superheated steam or other approved method. Any such manures, bone meal or bones introduced into Southern Rhodesia contrary to this regulation shall be liable to immediate destruction.

3. The areas set out in Schedule "A," and such further areas as may be added to the said schedule, shall be used in connection with pasture lands of the places to which they relate for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever.

4. The appointment of the areas set out in Schedule "B" hereto for the depasturing and quarantining of animals for slaughter in connection with the places therein mentioned is confirmed.

5. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel and the period for which the permit shall be in force. In cases where it may appear necessary or desirable, the person to whom any such permit is issued may be required to cause the animals

referred to therein to be dipped before being moved.

6. The introduction of sheep and goats against which no prohibition exists may be permitted by rail, subject to the following provisions:—

(1) Plumtree shall be regarded as the port of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto; provided, however, the Controller of Stock may allow the introduction of well-bred sheep or goats intended for sale or stud purposes without being previously dipped.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival; provided, however, that animals intended for immediate slaughter shall be exempt from dipping if marked with a distinctive brand on the back.

7. The introduction of sheep and goats against which no prohibition exists may be permitted by road, subject to the following provisions:—

(1) M'Lala Drift and Fort Tuli shall be regarded as ports of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival.

8. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Officer at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detrained at any intermediate station without the written authority of a Government Veterinary Surgeon.

9. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the police camp nearest to the place where such entry is made, and the officer in charge of such police camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

10. All horses, mules and donkeys upon entering Southern Rhodesia shall be tested with mallein, and the owner or person in charge of such animals shall, in all respects, carry out the lawful directions of the Inspector while such animals are being tested; provided that this regulation shall not apply to animals in transit by railway through Southern Rhodesia and which are not detrained en route.

11. The Inspector may direct the detention of any animal, and its isolation for the purposes of such examinations and tests as may be deemed expedient during which period of isolation or detention it shall be maintained and tended at the expense of the owner. If in the case of any such animal a second injection of mallein, applied at an interval of not less than ten days, is followed by a reaction indicative of the existence of glanders, such animal shall be forthwith destroyed.

12. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border to and from Portuguese East Africa, may be allowed so to cross on such terms as to registration, branding, testing and other conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

13. All horses, mules and donkeys depastured on the town lands of Melsetter and Umtali or on any public outspan adjoining such lands, and within the following area known as the Penhalonga, Imbesa and Samba Valleys, as bounded by the Umtali Waterfall Range on the north, the divide following beacons 18, 24 and 27 on the east, the Christmas Pass Range on the south, and the Palmyran Range on the west, in the district of Umtali, shall be dipped every fourteen days, by or at

the expense of the owner or person in charge of such animals, unless the local Veterinary Officer shall see fit to dispense with such dipping.

14. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings, fodder, excreta or other matter or thing which may be reasonably calculated to convey such infection.

15. Any person contravening the provisions of these regulations, or the instructions or directions given in terms of these regulations, shall be liable in respect of each offence to a penalty not exceeding twenty pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

W. H. MILTON.
Administrator.

By command of His Honour the Administrator.

F. J. NEWTON,
Treasurer.

SCHEDULE "A."

Areas on or near pasture land used in connection with townships set apart for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever:—

1. For the township of Salisbury and its neighbourhood, the Government Farm Makabusi, as defined in Government Notice No. 13 of 1898, namely, about six miles from Salisbury on the Old Charter Road, and bounded on the north, north-east and west by the farm "Willowdale," and on the south and south-east by the Makabusi River.

2. For the township of Umtali, a triangular piece of land situate to the north-east of the township, being that portion of the farm "Birkley" which falls in British territory.

3. For the township of Melsetter, a piece of land included within those lines bounding the pasture lands laid out around the township, which are in common with the outspan in the west, Sawerombi on the north, and Westfield on the north-east, bounded further on the south by a line drawn from the common beacon of Westfield and Lindley to the common beacon of Fairfield and outspan.

4. For the township of Enkeldoorn, a piece of land about 2½ miles due west of the township and bounded as follows: From a point about 400 yards above the junction of a stream running south of Enkeldoorn township with streams running west from the Police Camp; thence along the first stream to the junction aforementioned; thence along a valley running due south from the said junction to a point about 700 yards distant; thence in a north-westerly direction to a point on the top of a rise about 1,200 yards distant; thence in a straight line to the first-mentioned point.

5. For the township of Victoria, a strip of land half-a-mile in width lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

6. For the township of Gwelo, a triangular piece of ground within the reserved lands around Gwelo. It is bounded south by the Watershed Block along its boundary running from its joint beacon with Kanuck westwards to another beacon 1,518 Cape roods distant, bounded north-westwards by a line about 1,350 roods in length to the Inoculation Station, and bounded north-eastwards by a line from the first mentioned beacon to the Inoculation Station, and about 1,400 roods in length. This piece of ground is called the Inoculation Camp.

7. For the township of Bulawayo that portion of the commonage bounded on the west and north by the Bulawayo-Mafeking and Gwelo railway lines, on the east by the road known as "Hillside Avenue," on the south to the limits of the commonage and Hillside, known as "Napier's Lease," approximately 4,750 acres in extent.

SCHEDULE "B."

Areas set apart for depasturing and quarantining of animals for slaughter:—

SALISBURY.—Description of the area.—A piece of land, 400 acres in extent, situated on the Makabusi River, below Maggio's plot, towards the southern boundary of the Salisbury commonage.

BULAWAYO.—Description of the area.—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi Road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres, more or less.

GWELO.—Description of the area.—Starting from a point where the Ingwenia Road crosses the railway, along this road past the sanitary stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the commonage beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins Main Street extension along this to the railway line, and down this to the starting point.

UMTALI.—Description of the area.—Starting from a point at the south-east corner of the farm "Devonshire" and south-west of "Waterfall," up the stream to where it is joined by the stream commonly known as Rifle-butt Spruit, and up this spruit to a point 300 feet below Paulington Bridge. Thence almost due north on the west of Penhalonga Road to the sanitary pits and from the sanitary pits to the Cemetery, thence due west to the "Devonshire" line and along this line south to south-west corner beacon of "Waterfall."

SELUKWE.—Description of the area.—A piece of fenced land, in extent about 300 acres, situated on the farm "Sebanga" and adjacent to the township of Selukwe.

PENHALONGA.—Description of the area.—A piece of land bounded as follows:—To the northward by a line starting from the south-east beacon of the hotel stand to the south-west and south-east beacons of Crawford's butchery. To the eastward from the south-east beacon of Crawford's butchery to the northern boundary of the Penhalonga Proprietary Mines' ground. To the southward along the northern boundary line of the Pennaionga Proprietary Mines' ground. To the westward from the north-west beacon of the Penhalonga Proprietary Mines' ground to the south-east beacon of the hotel stand.

VICTORIA.—Description of the area.—A strip of land, half-a-mile in width, lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

SCHEDULE "C."

I, ...
residing at
in the district of in the
.....Colony, do solemnly and sincerely declare that the animals enumerated below are free from any contagious disease, including scab, and have not been in contact with any infected animals within six months from date hereof, and that to the best of my knowledge and belief such animals in travelling to* Station will not come in contact with any animals amongst which scab or any other contagious disease has existed during that period; further, that

such animals were thoroughly disinfected by dipping on..... and will enter Southern Rhodesia within ten days of having been dipped.

And I make this solemn declaration conscientiously believing the same to be true.

Declared to at on this day of before me.

.....

Resident Magistrate, Government Veterinary Surgeon, Scab Inspector, or Police Officer of district from which animals are being sent.

Number and general description of animals being sent

.....

Owner's name and Address

.....

Place in Southern Rhodesia to which animals are being sent

.....

* Station within Colony of origin.

CERTIFICATE ISSUED UNDER PROVISIONS OF SECTION I, GOVERNMENT NOTICE No. 295 OF 1908.

This is to certify that the animals enumerated below are, in my opinion, free from any destructive disease, including scab, and to the best of my knowledge and belief have not been in contact with any infected animals nor come from,or through, a locality where any such disease is known to exist or has existed for twelve months from date hereof.

Date.....

Place.....

.....

Signature of Government Veterinary Surgeon.

Number and general description of animals.....Pigs, ...Sheep, ...Goats.

Place from which animals are to be sent.....

.....

Owner's Name and Address

.....

Place in Southern Rhodesia to which it is desired to send the animals

.....

No. 110 of 1908.

Department of Agriculture,
Administrator's Office,
Salisbury, 16th April, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

(1) A permit shall be required from the Chief Inspector which may

contain such conditions as shall from time to time appear expedient.

(2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."

(3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.

(4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.

(5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcases thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.

(6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—

(1) Importation shall be through and direct from the Coast Ports of the Cape Colonies, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.

(2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.

4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcases, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.
GOVERNMENT NOTICE No. 110 OF 1908, SECTION 1 (2).

1. Applicant's Name and Address.....
2. Number and Class of cattle to be imported.....
3. Area or Farm and District where Cattle are at present located.....
.....
4. Area or Farm and District to which Cattle are to be moved.....
.....

Applicant's Signature.....

Date
Application
Permit No.

No. 60 of 1909.

Department of Agriculture
Administrator's Office,
Salisbury, 1st April, 1909.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal Government Notice No. 124 of 1908, and do hereby declare and make known that, notwithstanding anything to the contrary elsewhere provided, the importation of cattle for bona fide slaughter purposes may be permitted into the Umtali district from the adjoining Portuguese territory, under the following terms and conditions:—

(1) The importation and disposal of cattle, introduced in terms of these regulations, shall be under the absolute control and direction of the local Veterinary Surgeon or other duly appointed officer, and shall be regulated by the requirements of consumption.

(2) The importation shall be by rail only, and all cattle shall be detrucked at the slaughter enclosure and immediately confined therein.

(3) All cattle admitted to the slaughter area shall be immediately branded with the letters "V.D."

(4) All cattle admitted to the slaughter area shall be slaughtered within ten days of their admission, and under no pretext whatever shall cattle so admitted be permitted to leave the said area alive; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.

(5) No meat shall be removed from the said area without special permission unless it is entirely free from skin and ears.

(6) The hides of animals slaughtered in the said enclosure shall be immediately immersed in an approved insecticide for a period of not less than twelve hours, and shall not be removed from the said enclosure unless accompanied by a certificate signed by a Veterinary Surgeon that they have been satisfactorily disinfected and dried.

(7) Any person contravening the provisions of these regulations or the instructions or directions of the local Veterinary Surgeon or other duly authorised official, given in terms of these regulations, shall be liable, in respect of each offence, to a penalty not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, unless where more severe or heavier penalties have, by the aforesaid Ordinance, been expressly provided.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 268 of 1907.
Department of Agriculture,
The Treasury,
Salisbury, 26th December, 1907.

REMOVAL OF CATTLE FOR SALE.

NOTWITHSTANDING anything to the contrary contained in the Regulations published under Government Notices Nos. 188 of 1906 and 217 of 1907, I, under and by virtue of the powers conferred upon me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide as follows:—

1. The assembly of cattle for purposes of sale by auction or otherwise may be permitted as such places and under such conditions as the Chief Inspector may from time to time prescribe.

2. The movement of cattle into the province of Mashonaland and the fiscal division of Gwelo from other places in Southern Rhodesia may be permitted under such conditions as the Chief Inspector may from time to time prescribe.

3. The granting of permits for the purposes of Sections 1 and 2 hereof and the nature of the conditions to be attached thereto shall be at the absolute discretion of the Chief Inspector.

4. Any person contravening the provisions of these Regulations or the conditions attached to permits issued thereunder shall be liable to a fine not exceeding £20, or, in dafault of payment, to imprisonment with or without hard labour for a period not exceeding three months .

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 216 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 23rd September, 1909.

MOVEMENT OF CATTLE, PROVINCE OF MASHONALAND AND DIVISION OF GWELO.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices No. 217 of 1907, Nos, 114 and 170 of 1908 and No. 199 of 1909, and so much of any

other Regulation as may be repugnant to or inconsistent with the provisions of these Regulations, and declare that the following shall be of full force and effect in lieu, from date of publication, within the Province of Mashonaland and the Fiscal Division of Gwelo, as defined by the "Southern Rhodesia Boundary Regulations Amendment Regulations, 1898," which areas are hereby declared to be infected with a destructive disease:—

1. The movement of cattle within the said areas is prohibited save and except—

(*a*) on permission granted by an inspector or sub-inspector or other officer authorised by the Administrator;

(*b*) within the boundaries of any single farm where such cattle are depastured;

(*c*) within any area enclosed by a substantial fence;

(*d*) within the boundaries of the various commonages, town lands or grazing ground common to any mining camp;

(*e*) for cattle the property of natives within a radius of four miles of their owners' kraal situate within the boundaries of any native location or reserve; the site of such kraal shall be deemed to be the place where it is situated at the date of publication hereof, and as is hereinafter further provided.

2. The movement of cattle for *bona fide* farming, breeding, mining, dairying, grazing and slaughter purposes may be permitted under the written authority of an official thereto duly authorised, subject to the following terms and conditions—

(*a*) the written permission of owners, occupiers or managers of all occupied lands, and, in the case of native reserves, of the Native Commissioner of the district over which cattle shall pass, is obtained; provided that, in the event of such owners, occupiers, managers or Native Commisssoners refusing to grant such permission, the Controller of Stock may direct the issue of a permit of removal if satisfied that the necessary permission is withheld without good and sufficient cause; and provided further that such permission shall not be required in respect of any movement of cattle within native districts or group of native districts as defined under Section 3 hereof, or in such districts or group of districts as may hereafter be defined, or in respect of movements authorised in terms of subsection (*c*) of the said Section;

(*b*) that such cattle shall, before being moved, be thoroughly dipped or sprayed to the satisfaction of the officer issuing the permit, and, if intended for slaughter, shall where possible be branded, under the supervision of the officer issuing the permit, with the letters "V.D." on the near hind quarter;

(*c*) that cattle intended for slaughter shall, on arrival at destination subject to the terms of clause (*d*) hereof, be immediately taken to the prescribed quarantine area and there be quarantined and confined, and, where not branded in terms of clause (*b*) hereof, be similarly branded under the supervision of a duly authorised officer;

(*d*) that all cattle intended for slaughter brought to their destination and not dipped or sprayed in terms of clause (*b*) hereof, shall be immediately thoroughly dipped or sprayed

(*e*) that all cattle admitted to the quarantine area shall be slaughtered within twenty-one days of admission, and only be permitted to leave the area for the purpose of being driven to the abattoir for slaughter;

and all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found outside the said area, at large or in possession of any person may be destroyed under an order of the Chief Inspector or Controller of Stock;

(*f*) that intermediate depots, or concentration camps, for slaughter stock may be allowed at centres approved of by the Chief Inspector of Cattle, provided that no such camp shall be situated within a less radius than five miles of any commonage, town lands, or grazing ground common to any mining camp, railway station or siding.

3. The movement of working cattle may be permitted under the written authority of an official thereto duly authorised--

(*a*) within the borders of the following native districts:—Gwelo, Hartley Lomagundi, Marandellas, Melsetter, Selukwe and Umtali;

(*b*) within the following groups of native districts:—

(1) Charter and Chilimanzi;
(2) Mtoko, Mrewa, Makoni and Inyanga;
(3) Goromonzi' Mazoe and Darwin;
(4) Chilimanzi, Victoria, Ndanga and Chibi;

(*c*) between the Makondo Copper Mine in the Ndanga district and Karombe's Kraal in the Umtali district along the west bank of the Sabi river;

Provided that all cattle working under this section should be thoroughly dipped or sprayed every fourteen days, and provided that movements will be permitted for such periods as the Controller of Stock may in his discretion and on the advice of the Chief Inspector deem expedient, and that such permission may at any time be withdrawn or withheld without notice.

4. All applications for the removal of cattle from one native district to another shall be submitted for the approval of the Cattle Inspectors of the districts to and through which movements are made. All permits granted under the provisions of these regulations shall specify the number and brands of cattle, route to be traversed and time to be allowed for each journey, and such other conditions as it may be deemed expedient to prescribe; and all such permits shall be in the possession of the person travelling with or in charge of the cattle. Any breach of such conditions shall be deemed a contravention of the regulations in terms of section 9 hereof.

5. All veld-fed animals within the limits of the various commonages or town lands, or other centres where there is a common grazing ground and upon which public dipping tanks have been established, shall be dipped therein at least once every fourteen days; provided that the Controller of Stock may, on the advice of the Chief Inspector, direct the temporary suspension of this regulation for such reasons as he may regard as sufficient.

6. The following charges shall be paid at the time of dipping by the owner of the cattle or other animals required to be dipped under these regulations in respect of any dipping done at the public dipping tank:—

For horned cattle, 6 months and over	3d. per head.
For horses and mules	3d. „
For calves (under 6 months) and donkeys ...	2d. „
For small stock	½d. „

with a minimum charge of 6d. for any number of animals not aggregating such fee under the above tariff.

7. Any permit granted may be summarily suspended by any Inspector or Sub-Inspector or member of a police force finding cattle travelling under the same to be infested with ticks, and such officer may detain such cattle until such time as the animals have been cleansed to his satisfaction.

Any dipping or spraying required to be done under these regulations shall be carried ont with an approved tick-destroying agent by the owner of the animals; provided that the Inspector or Sub-Inspector may at his discretion carry out such treatment at the entire cost of the owner of such animals.

The Controller of Stock may, on the advice of the Chief Inspector, direct the temporary suspension of dipping and spraying for such reasons as he may regard as sufficient.

8. Whenever the owner, occupier or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying or dipping or any other method permitted by these or any other regulations, the Cattle inspector may order such natives or others as have cattle on the same farm to cleanse such cattle or any others before permitting them to enter or pass over such area, and the Native Commissioner of the district in which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle, at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

9. Any person contravening any of the provisions of these regulations shall, upon conviction, be liable, in respect of each offence, to the fines and punishment prescribed by the Ordinance; and, in the case where no special punishment is provided, to a fine not exceeding £20 or, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding three months unless the penalty is sooner paid.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,
For Treasurer.

No. 356 of 1908.
Department of Agriculture,
Administrator's Office,
November, 1908.

MOVEMENT OF CATTLE INTO MATABELELAND.

NOTWITHSTANDING anything to the contrary contained in the Regulations published under Government Notices Nos. 188 of 1906 and 217 of 1907, I, under and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide as follows:—

1. The movement of cattle from the Province of Mashonaland into the Province of Matabeleland and from the Fiscal Division of Gwelo into other parts of Matabeleland may be permitted under such conditions as the Chief Inspector may from time to time prescribe, provided, however, that such movement shall not be permitted in respect of cattle imported from the country to the North of the Zambesi River until they shall have first remained for a period of at least twelve months in the Province of Mashonaland or the Fiscal Division of Gwelo.

2. The granting of permits for the purposes hereof, and the nature of the conditions to be attached thereto, shall be at the absolute discretion of the Chief Inspector.

3. Any person contravening the provisions of these regulations, or the conditions attached to permits issued thereunder, shall be liable to a

fine not exceeding £20, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No 39 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 11th March, 1909.

MOVEMENT OF CATTLE, PROVINCE OF MATABELELAND.

1. UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 188 of 1906 and 216 of 1907, and declare the following to be of full force and effect in lieu thereof within the province of Matabeleland, exclusive of the district of Gwelo, as described and defined by section 4 (c) of the Southern Rhodesian Boundary Regulations Amendment Regulations, 1898, which is hereby declared to be an area infected with a destructive disease, and is hereinafter called the said area.

2. The movement of all cattle within the said area is prohibited save and except

(a) on permission granted by the local Cattle Inspector;

(b) within the boundaries of any single farm where such cattle are depastured;

(c) within an area of land enclosed by a substantial fence;

(d) within a radius of four miles from any native kraal situate within the boundaries of any native location or reserve, and as hereinafter further provided.

3. The movement of cattle for slaughter, grazing, bona fide farming, mining or breeding purposes, or for private milk supplies, shall be permitted under the written authority of an official thereto duly authorised, subject to the following terms and conditions:—

(a) that the written permission of owners, occupiers, or managers of all occupied land, and in the case of native reserves, of the Native Commissioner of the district over which such cattle shall pass, is first obtained; provided that in the event of such owners, occupiers, managers or Native Commissioners refusing to grant permission, the Controller of Stock may direct the issue of a permit of removal, if satisfied that the necessary permission is withheld without good and sufficient cause;

(b) that such cattle shall, before being moved, be thoroughly disinfected by dipping or spraying, to the satisfaction of the officer issuing the permit, and at the expense of the owner of such stock, and, if intended for slaughter, shall where possible be branded, under the supervision of the officer issuing the permit, with the letters "V.D." on the near side of the neck;

(c) that cattle intended for slaughter, shall, on arrival at destination, subject to the terms of clause (d) hereof, be immediately taken to the prescribed quarantine area and there be quarantined and

confined, and, where not branded in terms of clause (b) hereof, be similarly branded under the supervision of a duly authorised officer;

(d) that all cattle intended for slaughter brought to their destination and not disinfected by dipping or spraying, in terms of clause (b) hereof, shall be immediately taken to the public dipping station and there be thoroughly dipped or sprayed before being taken to the quarantine area;

(e) that all cattle admitted to the quarantine area shall be slaughtered within twenty-one days of the admission, and only be permitted to leave the area for the purpose of being driven to the abattoir for slaughter; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area, or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.

4. The movement of working cattle may be permitted under the following conditions only:—

Within the said area from private farms, mines and trading stations to any centre of consumption, or to or from a railway station or siding, or to and from any other farm under the permit of a duly authorised officer, which permit shall fully set forth the route to be traversed; provided that no permit shall be issued until the person applying for the same shall produce the written consent of owners, occupiers or managers of occupied lands proposed to be traversed, and in the case of native reserves, of the Native Commissioners, and that such cattle, before being moved, be thoroughly disinfected by dipping or spraying at the expense of the owner, and to the satisfaction of the officer issuing the permit; provided, further, that in the event of such consent being unreasonably withheld, the Controller of Stock may direct the issue of a permit.

5. All applications for the removal of cattle from one native district to another shall be submitted for the approval of the Government Veterinary Surgeon at Bulawayo and the Cattle Inspector of the district to which the removal is to be made.

6. All permits granted under the provisions of this notice shall specify the number and brands of cattle, route to be traversed, and time allowed for each journey. Any breach of these or other conditions endorsed on the permit by the issuing officer shall be deemed a contravention of these Regulations, in terms of section 9 hereof.

All veld-fed animals within the limits of the various commonages or townlands, or other centres where there is a common grazing ground and upon which public dipping tanks have been established, shall be dipped therein at least once every fourteen days; provided that the Controller of Stock may, on the advice of the Veterinary Department, direct the temporary suspension of this Regulation, for such reasons as he may regard as sufficient.

8. The following charges shall be paid at the time of dipping by the owner of the cattle or other animals required to be dipped under these Regulations, in respect of any dipping done at a public dipping tank:—

For Cattle (over six months)	3d.	per head.
,, Horses and Mules	3d.	,,
,, Calves (six months and under)	2d.	,,
,, Small Stock	½d.	,,

with a minimum charge of 6d. for any number of animals not aggregating such fee under tariff.

9. Any disinfecting by spraying required to be done under these Regulations shall be carried out with an approved insecticide by the owner of the animals so sprayed; provided that the Inspector may, at his discretion, carry out such disinfection, with the assistance of and at the entire cost of the owners of the animals sprayed, the cost of such disinfection being payable at the time of the spraying.

10. Any person contravening any of the provisions of these Regulations shall, upon conviction, be liable, in respect of each offence, to the fines and punishments prescribed by the Ordinance; and, in the cases where no special punishment is provided, to a fine not exceeding £20; or, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding three months, unless the penalty be sooner paid.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.
F. J. NEWTON,
Treasurer.

No. 101 of 1909.
Department of Agriculture,
Administrator's Office,
Salisury, 19th May, 1909.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the disease amongst live stock, due to the organism known as Trypanosoma Dimorphon, to be a destructive disease within the meaning of the said Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.
F. J. NEWTON,
Treasurer.

No 45 of 1909.
Administrator's Office,
Salisbury, 13th March, 1909.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 156 and 228, of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the

first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcases of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. In the event of any outbreak of rabies occurring, all owners of dogs within fifteen miles of such outbreak, or such other area as may be fixed, shall, on notification by any of the above-mentioned officials, or by Government Notice in the "Gazette," at once place and keep their dogs in a safe enclosure, or chained up, for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash held by the person exercising them.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the

owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON.
Treasurer.

No. 249 of 1908.
The Treasury,
Salisbury, 27th August, 1908.

PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON.
Treasurer.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

(a) Birds and Small Buck.

(b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tasessibe, Waterbuck and Wildebeest.

(c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—

In Mashonaland:
Birds from 1st May to 30th September.
Small Buck from 1st May to 31st October.

In Matabeleland:
Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Secretary for Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Secretary for Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Velt in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 40 of 1909, amended by No. 128 of 1909, withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1910, and transfers from Class "C" to Class "B" Eland, Koodoo, and Zebra so far as that area is concerned. Under Government Notice No. 129 of 1909 game in Class "B" may be shot without a licence in this area.

Game in Class "A" may be hunted in the close season until further notice, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Salisbury, Bulawayo, Umtali and Melsetter; within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the landowner.

No. 128 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 10th June, 1909.

GAME LAW CONSOLIDATION ORDINANCE, 1906.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby declare and make known that the area described in section 1 of Government Notice No. 40 of 1909 shall be extended and include the area bounded as follows:—

From the Railway bridge on the Umfuli River thence north-westwards along the Umfuli River to where it joins the Umniati River, thence south-wards along the Umniati River to where it joins the Umsweswe River, thence eastwards along the Umsweswe River up to the drift at the Lydia Mine, thence along the old road from Lydia Mine to Etna Mine and to Inez Mine, thence northwards along the road from Inez Mine to Hartley, thence in the direction of the Railway bridge to the starting point on the Umfuli River.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council..
P. D. L. FYNN,
For Treasurer.

Ordinance No. 1, 1908.] [Promulgated 18th December, 1908

SOUTHERN RHODESIA.

AN ORDINANCE TO FURTHER AMEND THE LAW WITH REFERENCE TO THE BRANDING OF STOCK.

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

1. Sections 7, 8, 9, 10 and 13 of "The Brands Ordinance, 1900" (herein after referred to as the said Ordinance), and so much of any other law as is repugnant to or inconsistent with the provisions of this Ordinance are hereby repealed; but such repeal shall not be taken to affect the validity of any brand duly registered at the time of coming into operation of this Ordinance.

2. No person shall have the right of claiming to have any special form or design of brand allotted to him, but any person requiring a brand shall, on application, and on payment of the prescribed fee, have a brand allotted to him by the Registrar.

3. Section 23 of the said Ordinance is hereby amended by the addition of the following sub-section:—

"(6) The system and procedure to be observed by the Registrar in allotting brands."

4. This Ordinance may be cited for all purposes as the "Brands Ordinance Amendment Ordinance, 1908."

Above is the text of the Ordinance passed during the last Session of the Legislative Council, the object of the Ordinance being to so amend the Brands Ordinance, 1900, as to permit of the system of branding known as the "Three piece system."

Following are the regulations promulgated under the Ordinance, and which brought the new system of registration into operation on 7th January, 1909.

No. 391* of 1908.

Department of Agriculture,

Administrator's Office,

Salisbury, 17th December, 1908.

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdrew the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

* Republished with corrections.

9. There shall be payable to the Registrar or Deputy Registrar:—

(a) For every separate registration of a brand, 5s.
(b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next in order, according to the following table:—

i. Off Neck or Rump (or Thigh);
ii. Near Shoulder (or Top of Arm);
iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

i. Off Rump (or Thigh);
ii. Near Shoulder (or Top of Arm);
iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

i. On Near Side or Ribs;
ii. Near Rump (or Thigh);
iii. Off Shoulder;
iv. Off Side or Ribs;
v. Off Rump (or Thigh).

(d) In the case of ostriches:—

i. On Near Thigh;
ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette."

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the provisions of this section shall on conviction be liable to a fine not exceeding £5.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

P. D. L. FYNN,
Acting Treasurer.

SCHEDULE A.

APPLICATION FOR A BRAND.

Brands Ordinance, 1900, and Brands Ordinance Amendment Ordinance, 1908.

To the Deputy Registrar,

.....

Herewith we enclose the prescribed fee of.....and request that you will allot and register a brand for the holding or place mentioned in the Schedule below.

Name of Applicant in full.	Address.	District or Sub-district for which Brand is required.

Date.....

.....

Applicant.

SCHEDULE B.

Brands Ordinance, 1900, and Brands Ordinance Amendment Ordinance, 1908.

No.....

..... day of

I hereby certify that the brand shown in the diagram at foot hereof was duly registered on the date and asthe brand of the person(s) therein set forth in the schedule hereto.

Owner(s)' full Name.	Address.	District for which Brand is registered.	Date of Registration.

Fee paid.....

Diagram of Brand.....

(Signed).....

Registrar of Brands.

SCHEDULE C.

MEMORANDUM OF TRANSFER OF BRAND.

Brands Ordinance, 1900, and Brands Ordinance Amendment Ordinance, 1908.

We,.....being the registered owner(s) of the brand set forth in the schedule hereto, do hereby agree to the transfer of the same to.....of.....and hereby request that the same may be registered accordingly. And we....., the second undersigned, do also hereby agree to the said transfer and enclose the fee therefor (..... Shillings).

Witness..... Owner.

Address.....

.....

Witness..... Transferee.

Address.....

.....

Brand.	Name and Address of Registered Owner of Brand.	District where Brand is Registered.	No. of Certificate.	Date of Registration.

.....

No. 228 of 1909.

Department of Agriculture,

Administrator's Office,

Salisbury, 7th October, 1909.

WHEREAS the disease known as "foul brood" exists, or is supposed to exist, among bees in Australia, New Zealand, and the continent of America, including the West Indies, and the continent of Europe, including Great Britain and Ireland:

Now, therefore, under and by virtue of the powers vested in me by the "Injurious Substances and Animals Ordinance, 1909," I do hereby declare and make known that

1. From and after this date it shall not be lawful for any person to introduce or cause to be introduced into Southern Rhodesia, except with the written permission of the Director of Agriculture, and subject to the production, in the case of each consignment, of sworn declarations in accordance with the forms set forth in the annexures contained in the schedule hereto, as the case may require, bees, beeswax, foundation comb, honey, used beehives, or used beehive accessories or appliances, or any article or thing that has been used to contain or manipulate bees or beeswax.

2. The above prohibition shall not apply to the introduction of bees, beeswax, foundation comb, honey, used beehives or beehive accessories from any neighbouring Colony or State which shall by its own regulations have prohibited the importation of bees, beeswax, foundation comb, honey, used beehives or beehive accessories, subject to the aforesaid exemption to any neighbouring Colony or State.

3. Any bees, beeswax, foundation comb, honey, used beehives or beehive accessories unlawfully imported, or imported otherwise than in accordance with the provisions of these regulations, or found to be affected with any disease, shall be liable to immediate confiscation and destruction, or to be quarantined at the expense of the owner until, in the opinion of the Director of Agriculture, any source of danger has been removed or has disappeared.

4. Any person contravening the provisions of these regulations, or any directions or instructions given in terms of these regulations, shall be liable in respect of each offence to a fine not exceeding £100, or in default of payment thereof to imprisonment, with or without hard labour, for a period not exceeding one year.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,
For Treasurer.

SCHEDULE.

ANNEXURE "A."

Form of Declaration required to accompany Importation of Bees.

I / We do solemnly and sincerely declare that the undermentioned Bees were supplied by me / us to..... of.....on.....and that no Bee disease of any description exists on our premises or within two miles (three kilometres) thereof.

And I / we make this solemn declaration conscientiously believing the same to be true.

.....

Declared at.....this..... ...day of 19.....

Before me.

.....

Justice of the Peace
or other Officer authorised
to administer oaths.

Number of Bees referred to in this Declaration,.....

ANNEXURE "B."

Form of Declaration required to accompany Importation of Beeswax.

I / We do hereby solemnly and sincerely declare that the undermentioned Beeswax supplied by me / us to..... of on..... has been melted for not less than two and a half hours, at a temperature of not less than 212 degrees Fahr., and has not subsequently been on premises, or within two miles of premises, where Bee disease of any description is known to exist.

And I / we make this solemn declaration conscientiously believing the same to be true.

.....

Declared at.....this.....day of 19.....

Before me,

.....

Justice of the Peace
or other Officer authorised
to administer oaths.

Quantity of Beeswax referred to in this Declaration

ANNEXURE "C."

Form of Declaration required to accompany Importations of Foundation Comb.

I / We do hereby solemnly and sincerely declare that the undermentioned Foundation Comb supplied by me / us to.....

of.....on.....has been made from Beeswax that has been melted for not less than two and a half hours, at a temperature of not less than 212 degrees Fahr., and has not subsequently been on premises, or within two miles of premises, where Bee disease of any description is known to exist.

And I / we make this solemn declaration conscientiously believing the same to be true.

.....

Declared at this.....day of 19.....

Before me,

.....

Justice of the Peace or other Officer authorised to administer oaths.

Quantity of Foundation Comb referred to in this Declaration.....

No. 52 of 1909.
Department of Agriculture,
Administrator's Office.
Salisbury, 25th March, 1909.

CONDITIONS UNDER WHICH GOVERNMENT VETERINARY SURGEON'S SERVICES ARE AVAILABLE TO THE PUBLIC.

1. ON and after 1st April, 1909, the services of Government Veterinary Surgeons will be available to the public, free of charge for the following purposes only:—

(1) Attending and giving professional advice in connection with the following diseases, viz.:—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lung-sickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

(2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

(3) Inoculations against the following diseases:—

Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater,

Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz.:—

	£	s.	d.
(1) For every professional visit within three miles of his office or residence	0	5	0
(2) For every professional visit beyond such distance plus an additional charge of 2s. 6d per hour whilst engaged in such visits, or £2 2s. a day of 24 hours:	0	10	6
(3) For advice given at the Veterinary Surgeon's office, for each animal, per visit	0	2	6
(4) The following to be charged in addition to visiting fees:—			
a. For every examination as to soundness, each	1	1	0
b. For castration, horses, each	1	1	0
c. ,, bulls ,, ...	0	5	0
d. ,, donkeys ,, ...	0	10	6
e. For parturition cases, mares, each	2	2	0
f. For parturition cases, cows, each	1	1	0
g. For other operations, according to nature, from 5s. to £2 2s.			

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government veterinary surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government veterinary surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the veterinary surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government veterinary surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government veterinary surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government veterinary surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 281 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 2nd December, 1909.

UNDER and by virtue of the powers vested in me by section 8, sub-section (1) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the removal of the following articles from areas known or suspected to be infected with any destructive disease:

Skins, hides, green forage, hay of any sort, fodder, bedding, reeds, kraal or stable manure, or any article which may reasonably be supposed to convey infection, or infective insects.

Any person removing articles in contravention of the aforesaid prohibition shall be liable to the penalties on that behalf provided and to have such articles destroyed, in terms of section 5, sub-section (6) (a) of the aforesaid Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 262 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 25th November, 1909.

IMPORTATION OF CATTLE.

UNDER and by virture of the powers conferred on me by the "Animals Diseases Consolidated Ordinance, 1904," I do hereby cancel Annexure "B" referred to in sub-section (2) of section 1 of Government Notice 110 of 1908, as amended by Government Notice No. 87 of 1909, and in place thereof do substitute the following, which shall, from date of publication hereof, be the form required to accompany Annexure "A," also referred to in aforementioned sub-section.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

ANNEXURE "B."

I,.....
residing on the farm
in.....do solemnly and sincerely
declare that the..... (numbered in
writing) animals also enumerated below have been in my possession since

birth, and that lung-sickness, pleuro-pneumonia or other contagious or infectious disease has not existed amongst any of my cattle, nor on my farm, nor among any cattle with which these animals have been in contact within the last four years, and that these animals have never been exposed for sale in any public market or stock fair, nor been in contact with strange cattle, and that to the best of my knowledge and belief such cattle in travelling to Station (*i.e.*, station where cattle are to be trucked) will not come into contact with any animals amongst which lung-sickness or any other contagious or infectious disease has existed during that period.

Number of Animals..... Bulls..... Heifers..... ...

Breed.....

Seller's Name and Address.....

.....

Purchaser's Name

Place in Southern Rhodesia to which animals are being sent

.....

And I make this solemn declaration conscientiously believing the same to be true.

.....

Declared to at.....on this.....

day of.....before me,

.....

Resident Magistrate for the district of

.....

No. 44 of 1910.

Department of Agriculture,

Administrator's Office,

Salisbury, 3rd March, 1910.

ESTABLISHMENT OF A POUND AT BELINGWE.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Bulawayo, a pound has been established at Belingwe, in the fiscal division of Bulawayo, and the said pound shall be available for the public from the 7th day of March, 1910.

W. H. MILTON,

Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,

Treasurer.

No. 309 of 1909.

Department of Agriculture,

Administrator's Office,

Salisbury, 30th December, 1909.

IMPORTATION OF PLANTS &c., REGULATIONS.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that the following regulations shall be of force and effect on and after

1st day of March, 1910:—

(1) No person shall introduce into Southern Rhodesia from outside South Africa any consignment of potatoes unless accompanied by a certificate from the consignor stating fully in what country and district of that country the potatoes were grown, and that the disease known as Warty disease or black scab, caused by the fungus *Chrysophlyctis endobiotica* Schil, is not known to occur on the land on which the potatoes were grown. Any consignment not accompanied by such certificates will be liable to be seized and destroyed.

(2) All consignments of potatoes which are imported from other parts of South Africa or from oversea, if found on inspection to be infested with any pest or disease, other than black scab, will be sorted at the expence of the consignee and the diseased tubers destroyed.

(3) A charge of 6d. per bag or case will be made for sorting.

(4) Should any consignment on arrival be found to be infested with black scab, it will not be sorted but will be totally destroyed.

(5) Any person guilty of a contravention of these Regulations shall be liable to a fine not exceeding £10.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 263 of 1909.

Department of Agriculture,
Administrator's Office.
Salisbury, 25th November, 1909.

IMPORTATION OF SWINE.

NOTWITHSTANDING the prohibition which exists under section 1 subsection 3 of Government Notice No. 295 of 1908 against the importation of swine from the Colony of the Cape of Good Hope, I, under and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide that swine may be imported from the Cape of Good Hope under a permit issued by the Chief Inspector or Examiner of Stock, and subject to any examination and quarantine on entry that may be necessary, and to such other conditions as may be deemed expedient to attach to such importations.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 264. of 1909.

Department of Agriculture.

Administrator's Office,

Salisbury, 25th November, 1909.

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of horns and raw hides of cattle from the Bechuanaland Protectorate.

Any horns or hides introduced in contravention of this prohibition shall be confiscated and destroyed.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 10 of 1910.

Department of Agriculture.

Administrator's Office,

Salisbury, 27th January, 1910.

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of hides of every description from North-Western Rhodesia and Portuguese East Africa. I do further declare, in terms of section 5, sub-section (6) (a), that any hides introduced in contravention of this prohibition shall be confiscated and destroyed.

Any person contravening the provisions of this Notice shall, upon conviction, be subject to the penalties prescribed by the aforesaid Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 11 of 1910.

Department of Agriculture,

The Treasury,

Salisbury, 27th January, 1910.

IT is hereby notified for public information that the following appointments have been made under the "Animals Diseases Consolidation Ordinance, 1904:—

All Government Veterinary Surgeons who are at present or who may in

the future be appointed as such to be Inspectors.

All Native Commissioners and Assistant Native Commissioners who are at present or who may in the future be appointed as such to be Sub-Inspectors within their respective districts.

Abbott, Charles Frederick	Inspector	Victoria
Cameron, James Randall	„	Gwelo
Morris, Hugh Godfrey	„	Salisbury
Cameron, John	Sub-Inspector,	Lomagundi
Cumming, Guybon White	„	Enkeldoorn
Curran, Patrick	„	Umtali
Geise, Albert	„	Wankies
Glasock, Horace Harry	„	Salisbury
Gooyer, Edward Bertram	„	Gwanda
Harvey, William Egerton	„	Umtali
Hunt, William Ernest John	„	Hartley
Johnson, William	„	Insiza
Kayser, James Joseph	„	Mazoe
Leahy, Kenyon Arthur	„	Selukwe
Lee, Hans	„	Mangwe
Malan, Stephanus Henry	„	Bulawayo
McKenzie, Robert	„	Bulawayo
Orpen, Arthur Francis	„	Umtali
Van Straaten, Johannes Jacobus	„	Umtali
Whitie, John	„	Melsetter

By command of His Honour the Administrator.

F. J. NEWTON,
Treasurer.

No. 54 of 1910.
Department of Agriculture.
Administrator's Office,
Salisbury, 17th March, 1910.

UNDER and by virtue of the powers vested in me by sub-section (2) of section 4 of the "Game Law Consolidation Ordinance, 1906," I do hereby suspend the operation of the said Ordinance as to a portion of the Marandellas district, within an area extending one mile outwards from the African Coast Fever cordon fence, in respect of sable antelope, tssessebe, eland and koodoo.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON.
Treasurer.

No. 22 of 1910.
Department of Agriculture,
Administrator's Office,
Salisbury, 3rd February, 1910.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the provisions of section 11 of Government Notice No. 45 of 1909 to be in force over the area within a radius of fifteen miles of the B.S.A. Police Camp, Selukwe, for a period of six weeks from date of publication hereof.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council,

F. J. NEWTON,
Treasurer.

No. 46. of 1910.

Department of Agriculture,
Administrator's Office,
Salisbury, 10th, March, 1910.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I declare the provisions of Government Notice No. 22 of 1910 to be amended so as to exclude from the area therein mentioned the Kennels of the Gwelo Hunt, situated at the Guinea Fowl Mine, together with eccess from the kennels to the area outside the quarantine limit.

The removal of dogs from the quarantine area is prohibited.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 47 of 1910.

Department of Agriculture,
Administrator's Office,
Salisbury, 10th March, 1910.

AFRICAN COAST FEVER: TRANSVAAL.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows:—

1. All cattle within an area of twenty miles from the Crocodile River in the native districts of Tuli and Chibi shall, within one month from date hereof, be removed therefrom by the owners to such place or places as shall have been approved by the Native Commissioners of the said native districts respectively.

2. The introduction of all cattle into the aforesaid area is prohibited.

3. Any person refusing or neglecting to remove cattle from the area, as herein provided, or introducing cattle into such area, shall be liable to the penalties provided by the aforesaid Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 55 of 1910.

Department of Agriculture,
Administrator's Office,
Salisbnry, 19th March, 1910.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare that the provisions of section 11 of Government Notice No. 45 of 1909 to be in force throughout the native districts of Victoria, Chibi, Belingwe and Selukwe, for a period of six weeks from the 1st April, 1910.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 68, 1910.

Department of Agriculture,
Administrator's Office,
Salisbury, 26th March, 1910.

AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the movement of cattle within the native districts of Goromonzi and Mazoe, and all permits issued in respect of these districts, and now current, are hereby cancelled.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator.

F. J. NEWTON,
Treasurer.

Department of Posts and Telegraphs,

Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EYRE,
Postmaster General.

General Post Office, Salisbury,
20th July, 1909.

South African Stud Book

A RECORD of all classes of Stock, the object being to encourage the breeding of Thoroughbred Stock, and to maintain the purity of breeds, thus enhancing their value to the individual owner and to the country generally.

Applications for Membership, and entries of Stock should be addressed:

For Cape Colony to

A. A. PERSSE, P.O. Box 703, CAPE TOWN.

For Transvaal to

F. T. NICHOLSON, P.O. Box 134, PRETORIA.

For the Orange River Colony

E. J. MACMILLAN, Government Buildings, BLOEMFONTEIN.

A. A. PERSSE,
Secretary South African
Stud Book Association.



Photo by] [F. Coop.

Group of Sussex Cattle—Bull, Cow, two 2-year old Heifers, and one 1-year old Heifer.—Winners of 100 guineas Challenge Cup, Johannesburg Show, 1910. Owned by Government Stud and Experimental Farm, Potchefstroom.

THE RHODESIA

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Editorial.

AFRICAN COAST FEVER AT SALISBURY. A full account by the Chief Veterinary Surgeon regarding the appearance of African Coast Fever on the commonage of Salisbury will be found on another page. It is not therefore necessary to deal here with the details of this most unfortunate occurrence, or the steps taken to suppress it. The outbreak, however, raises a more genesal question calling for consideration and early settlement. No one to-day believes in spontaneous generation, yet, as far as can be ascertained, the disease, in the case of the outbreak at Marandellas a year ago and the recent instance at Salisbury, was not transmitted in the usual manner—that is, directly from ticks dropped by actively diseased cattle. It would seem as if some mode of transmission existed other than that commonly recognised, and which is becoming apparent only now, when the more common process no longer obtains; the disease being no longer general throughout the country. It is significant that both the Marandellas and Salisbury outbreaks occurred near

the railway line. It has been suggested that infected cattle may have been carried in cattle trucks from one point to another in one of the Colonies in which Coast Fever exists, and that ticks dropping off such animals could remain in the trucks for days and even weeks and cause an outbreak several hundreds of miles distant from the original seat of infection, although it is also true that no such case has occurred in Cape Colony or the Free State, which are nearer than is Rhodesia to the widely spread infected areas of the Transvaal and Natal.

PREVENTIVE MEASURES.—However this may be, and there can be no certainty on the point, one fact stands out very clearly and that is that the very possibility of such sporadic outbreaks, even at long intervals, is a serious menace to the pastoral industry, and that it behoves us to insure ourselves as far as possible against their occurrence and spread. No specific remedy has ever been discovered, but the procedure for stamping out African Coast Fever and precautionary steps taken against its spread are well understood, and the difficulty in dealing with the disease are only those inseparable from the application of the necessary measures.

In view of the possibility of African Coast Fever appearing at any place and at any time it is necessary for us as a farming and mining community to consider what can best be done to protect ourselves against this danger. The prohibition of all movement of cattle is obviously unthinkable, and the basis of argument must therefore be the maximum restriction of movement compatible with the continuance of mining and farming operations. It will be conceded that the movement of cattle for certain purposes is a *sine qua non* to existence in Rhodesia; that movement is the fruitful source of the spread of destructive diseases; and that transport is possible by other means than by the ox wagon, Although there are some who hold a different view, there is strong evidence to show that undoubtedly the principal means of conveying the infection has been the trek ox.

CONSEQUENCES.—The logical conclusion is that the removal of this danger would materially enhance the security of farming in Rhodesia, and what that means to the country, every farmer will know. Incidental effects besides freedom from disease consist in the altered objective of breeding

which would arise; suitability for draft being no longer a desideratum, the simplified problem of producing beef and milk would be left, and oxen would be available in larger numbers for farm work, resulting in an increased area under the plough. The time foreseen by some when Rhodesia will be a meat exporting country like Argentine and Australia will be materially hastened, and, though prices of oxen might fall, yet the cost and period of production of meat would be reduced, for three carcases of beef could be grown in what is to-day the lifetime of one trek ox. The price of cows and heifers might on the other hand be expected to increase, and, in consequence of the diminished risk in cattle raising, farming would become a yet more attractive livelihood and investment. Against this it may fairly be argued that the replacement of oxen by mules implies the outlay of additional capital for transport purposes, thereby increasing the cost of production of anything requiring hauling, whether mining material or farm produce. To some extent this outlay, which must necessarily be spent abroad, may be rendered not an entire loss by the use of the humble but reproductive ass in place of mule or motor traction. A corollary to general mule or motor transport is the construction of roads and light railways to serve as feeders to the trunk lines.

THE PRESENT POSITION.—Ox transport is to-day prohibited throughout Mazoe, Salisbury, Marandellas, and Melsetter, and is likely to remain so in the greater part of these districts for some time to come. The method therefore is already in force in a not inconsiderable portion of Rhodesia, containing as it does almost one third of its total farmers. It should be possible to derive from this area much interesting information as to the economic effects of such restrictions. General movement including ox transport within defined areas, but no movement from district to district, is mooted as a remedy. There is ample experience, both in this country and the adjoining colonies, to warrant the assertion that such a restriction is little better than none at all; that it is found exceedingly irksome, very liable to contravention and evasion, and ineffectual in securing the end in view. The question therefore resolves itself into a consideration of whether for the sake of security and an undoubted advantage to be reaped in years to come, the community is able and willing at the

present time to submit to what cannot be other than a considerable disability and to forego immediate convenience. Before a decision can be come to, the subject requires to be well ventilated and the interests of all sections of the community consulted. To this end a public enquiry, to collect evidence from all quarters, to sift the same and to issue an impartial conclusion on which action may be taken in the foundation of future regulations governing the movement of transport cattle, has been suggested and is to be commended as giving everyone a chance of expressing his views, and as enabling a conclusive decision to be arrived at.

THE FENCING ORDINANCE.—One immediate result of the outbreak of African Coast Fever has been that the farmers over a large part of the districts of Salisbury and Mazoe have taken steps to obtain the application of the Fencing Law. An abortive effort in this direction was made some time ago, but now, with the disease at their doors, it has been possible to obtain the assent of the necessary two-thirds majority before the law can be put in force. It is to be hoped that, in their own interest, farmers in adjoining districts will see their way to safeguard themselves in a similar manner, especially as the burden is not so great when shared by neighbours and when loans for the purchase of material are obtainable on easy terms from the Government. The erection of fences is, it should be remembered, no remedy of itself against Coast Fever and of no avail as an emergency measure, but is to be regarded as a preventative, or an insurance, against many diseases of stock, a protective step to be taken as early as possible, and certainly before danger threatens. It would be well that districts remote from the present trouble took thought and secured themselves against danger beforehand.

THE INTER-COLONIAL IRRIGATION CONGRESS.—This Conference, which had its origin at Robertson, Cape Colony, last year, met on the 3rd of May for its second annual session at Potchefstroom, Transvaal, under the Presidency of the Hon. General Botha, Premier of the Transvaal and Minister for Agriculture; when Rhodesia was represented by Mr. R. A Fletcher, M.L.C., and the Director of Agriculture. The

Congress was a great success, bringing together as it did farmers and others from all the British South African Colonies interested in the great problem of the utilization of water on the land.

Three objects of importance were realised. Firstly, questions of deep interest were ventilated by means of a series of instructive papers read by those most competent to deal with them and followed by valuable discussions by those equally capable of criticism and appreciation. Secondly, the meeting was brought about of men in friendly debate, all aiming at the fuller development of the resources of the country, statesmen of all shades of political opinion, Government officials and specialists on various branches of farming, capitalists, farmers, humble and prominent, while by publication in the Press a widespread prominence has been given to the subjects discussed.

Finally, the formation of the South African Irrigators Association was successfully and harmoniously achieved, a body brought into existence to represent the interests of irrigation throughout the Sub-continent, to foster the science and art, and to protect and promote the cause in the legislature and on the farm. The Hon. Dr. Smart is the first president, and under his enthusiastic leadership and with the good wishes of all sorts of South Africans the Association commences its career most auspiciously.

THE EXPORTATION OF MAIZE.—The experimental shipment of maize to England last year showed that it was possible to export our surplus of mealies at a small profit. It was also shown that it was only our better class of maize that will sell to advantage. This fact is well brought out in the accompanying extract of a letter from the important firm of corn factors, Messrs. John Jackson and Co., of 79, Hope Street, Glasgow, who recently addressed the Department of Agriculture on the subject, and to whom a standard f.a.q. sample of last year's export was sent, that is a sample drawn from a large number of parcels and truly representative of the fair average quality of the whole.

Their comments will be read with interest by maize growers and should stimulate the desire to grow a high-class article, which is always in demand, even when the inferior grade is unsaleable.

After examining the f.a.q. sample Messrs. Jackson and Co. wrote as follows:—

"The maize is of good quality and well adapted for the requirements of the trade here. It is dryer, better developed, and more uniform than American flat corn, which is principally used in this market for certain manufacturing purposes, and would bring a premium of approximately 2s. 6d. to 4s. per ton of 2,000 lbs. over American, according to the supplies and the purpose for which it is required. For ordinary cattle feeding purposes it would not bring materially over American, though in that case also it would get a decided preference owing to its great dryness. Just at present we are afraid it would be impossible to compete with American, which is offering at very moderate figures, having fallen approximately 10s. per ton during the last two months. Whether it will continue on the present low level is, we think, doubtful. Your South African maize will, we feel certain, though not for all purposes, bring a premium over fine River Plate and Danubian Maize. We believe that buyers in and around Glasgow will pay fully as much as any other port in the United Kingdom for maize like yours, because here it is used in large proportion for starch making and for distilling purposes, and it pays the manufacturer or distiller to give an extra price for a fine, dry grain such as yours. In most other markets the principal consumption of maize is simply for cattle feeding, and for that purpose the special qualities are not of the same value. Our market would take, we think, all the disposable surplus if only reasonable freights could be arranged.

"A great difficulty we have at present with both Glasgow and Leith is that they are handicapped by the high freight rates asked by the Association Lines as compared with London, Hamburg, etc.

"American mixed corn is buyable to-day for May and June shipments at the equivalent of 100s. per ton of 2,000 lbs. your terms."

It should be addded that the Glasgow market is accustomed to purchase maize under the La Plata Grain Contract, No. 18, of the London Corn Trade Association, which accepts the Government grader's certificate as final as regards quality.

INSTRUCTION IN DAIRYING AND POULTRY FARMING.—Arrangements have been made for a highly skilled dairy and poultry expert to visit Rhodesia, to make a tour of the country, visiting individual farms, and at suitable centres delivering lectures and demonstrations on such practical topics as butter making, cream separating and cream raising, the manufacture of cream and general cheeses, co-operation in dairying, the care of cows and calves, poultry keeping and the dressing of poultry.

The management of the dairy and the poultry yard in Rhodesian farms devolves frequently on the ladies of the household, and is largely of a domestic nature. It is not inappropriate, therefore, that for the purpose of giving instruction in these subjects a lady has been chosen, Miss Maidment, the principal of the Durham County Dairy School, who arrives in Rhodesia early in July, and will spend two months in the country. Miss Maidment has had a wide experience in the teaching of these subjects, having in the course of her career trained over 3,000 students, and for many years given lectures and demonstrations at the shows of the Royal Agricultural Society of England, and all over England.

It is admittedly impracticable to attempt to bring all interested in dairying to a common centre for a prolonged course of instruction, and it is hoped that Miss Maidment may be able to take to the people on the land, information and practical instruction of which it will readily be admitted all stand in much need.

It is suggested that Miss Maidment travels round, farmers and their families may come together at some convenient centre to meet her, and get the benefit of her wide knowledge and experience. Needless to say, at such centres, milk and cream and utensils should be provided. If farmers brought cream and fowls for demonstration purposes to some farm where dairying is being carried on, and where there are, therefore, the necessary separators, churns, butterworkers, etc., no doubt, much instruction of great value could be imparted, and many useful hints given to willing learners.

It is to be regretted that this visit must necessarily be paid at a time when the supply of milk is at its lowest, and when the difficulties of dealing with perishable commodities in a

warm country is least, yet, no doubt, sufficient material could be got together for demonstration purposes.

Suggestions for the tour and invitations for meetings will be welcomed by the Director of Agriculture and should be forwarded early, as the whole tour must be arranged as long beforehand as possible, and the time at Miss Maidment's disposal is limited.

FARMERS' ASSOCIATIONS.—The formation of a new Farmers' Association at Somabula of which the President is Mr. Shone, of Dewhurst, the Secretary Mr. S. Annandale, of Prairie, private bag, Somabula Siding, is proof of the growing influence of these bodies and the realisation by the farmers of the value of such societies both as a means of exchanging ideas on farming matters and of making representations to Government on matters of common interest. The former object is apt to be lost sight of and the latter perhaps too freely exercised to carry the fullest weight, but the papers read at the Hartley and the Maize Show inaugurated by the Kimberley Reefs Association, mentioned elsewhere, are steps the educational value of which it would be difficult to exaggerate, so practical and far-reaching are they. It is understood that arrangements have been made for holding the Agricultural Union meetings—the annual conference of all the 25 affiliated Associations—at Bulawayo this year, on the 17th and 18th June, immediately after the Show.

THE SHOW SEASON.—The prospects of the forthcoming Shows have been considerably blighted by the enforced deletion of the cattle classes. At Bulawayo a novel feature is to be a luncheon consisting, as far as possible, entirely of Rhodesian grown products. The menu should prove an interesting study and will no doubt draw attention in a striking manner to the possibilities of the country, and prove a valuable lesson to consumers and producers alike. In spite of the absence of cattle there should be good exhibits of horses, small stock and produce, and in these respects there is no reason for not making a successful exhibition of the progress of agriculture during the year. It is the intention of the Department of Agriculture to arrange an exhibit demonstrating its activities in the field of research

and experiment, so as to bring to the notice of our farmers the ways in which they can be assisted, more especially how they may be helped to help themselves and one another.

The Kimberley Reefs, with commendable enterprise, has arranged to hold a Mealie Show at which, however, other classes of exhibits of interest will also be welcomed. The show is to be followed by a banquet and a dance; other Farmers' Associations please note!

The following are the dates fixed:—

Umtali Agricultural Show ...	9th and 10th June.
Bulawayo „ „ ...	15th and 16th June.
Salisbury „ „ ...	23rd and 24th June.
Kimberley Reefs Maize Show ...	8th July.

AGRICULTURAL SEEDS AND FRUIT TREES. — Several catalogues from South African seedsmen and nurserymen have recently been received. Messrs. C. Starke and Co., Ltd., of Mowbray, Cape Colony, submit a catalogue of peculiar interest, in that it comprises a number of grasses, clovers, and other forage plants, which have within the last few years come into public notice as a result of widespread experiments conducted by farmers. Those which have proved suitable are now coming into general use in different parts of South Africa, and a demand is springing up for the seed of such grasses as *paspalum dilatatum*, *phalaris*, cocksfoot, the fescues, teff, and Rhodes grass, and for certain leguminous forage plants like white clover, Egyptian clover, vetches, sanfoin, sulla, as well as lucerne. Root crops such as mangolds, swedes, and turnips, sugar beet, chicory, field carrots are more and more frequently to be met with, and in several varieties, also rape, kale, cabbage, flax, millets and sunflowers, while the merits of helianti—the newest of many new fodder plants—and leosinte are not unknown. In mentioning these we have endeavoured to name crops which are only emerging in most cases from the experimental condition now stocked by this enterprising firm, and of which as yet many farmers are still ignorant, while all alike have difficulty in procuring seed. It is interesting to find Natal red top grass (Tricholoena rosea) quoted at 10s. per pound, for, although the seed is extremely light and small, yet the grass is exceedingly common on practically every piece of broken up land in

Rhodesia. The firm specialise also in cereals, especially barleys and rust resistant wheats.

Messrs. H. E. V. Pickstone and Brother, of Groot Drakenstein, Paarl, Cape Calony, have issued their annual catalogue, and are to be commended for distributing not only a price list but a detailed description of the varieties they offer, explaining the merits and peculiarities of each, and further, giving numerous practical hints for the successful establishment of the trees when received.

A similar catalogue of fruit trees comes from the Trappist Mission at Centecow, Dronk Vlei, Natal, which is devoted to the propagation for sale of deciduous fruit trees only.

Messrs. W. and C. Gowie have the special advantage of an address in Rhodesia at Bulawayo, as well as at Bloemfontein and Grahamstown, and, while offering a large assortment of fruit trees and agricultural seeds, are particularly prominent in the region of vegetable seeds and in the aesthetic side of horticulture in the supply of ornamental trees and shrubs and flowers.

With these catalogues to choose from, there is little excuse tor the farmer to-day to plant only mealies, or to be without an orchard, or flowers.

THE NUMBER OF FARMERS IN RHODESIA.—From various sources, official and otherwise, a list of the occupied farms in Southern Rhodesia has been compiled. The difficulty of such task has been greater than was anticipated and than would at first sight appear. The definitions of a farm and a farmer are not always easy, but in preparing these statistics as far as information could be obtained, only beneficially occupied farms were considered. The returns are somewhat startling, especially the fact brought out that Mashonaland contains more than double the number of occupied farms to be found in Matabeleland. The grand total is 1,470 farmers, of whom 990 are in Mashonaland, and 480 in Matabeleland. The returns were scheduled according to native districts, none of which are without farms, though Sebungwe comes very near it with only one Invorka, while Mazoe tops the list with 132.

The following figures which, however, as undergoing con-

stant change and augmentation, will, no doubt, interest many readers.

District.	No.		
Belingwe	12		
Bubi	89		
Bulalema-Mangwe ...	122		
Charter	78		
Chibi	2		
Chilimanzi	48		
Goromanzi	128		
Gutu	4		
Gwelo	71		
Hartley	84		
Inyanga	21		
Insiza	49		
Lomagundi	58		
Makoni	66		
Marandellas	94		
Matobo	52		
Mazoe	132		
Melsetter	103		
M'Rewa	18		
Mzingwani	22		
N'Danga	9		
Sebungwe	1		
Selukwe	31		
Tuli	9		
Umtali	62		
Victoria	83		
Wankies	22		
Total for Matabeleland ...		990	
Total for Mashonaland ...		480	
Grand Total for Southern Rhodesia			1,470

AFRICAN COAST FEVER.—At the moment of going to press information has been received of the occurrence of African Coast Fever at a fresh centre in Salisbury district, nine miles to the west of the town, and of an outbreak at Essexvale in Matabeleland. The necessary steps to deal with these very unlooked for and unfortunate cases are being taken.

Farms and Farming in Rhodesia.

MELSETTER.

By ERIC A. NOBBS, Ph.D., B.Sc.

The history of the occupation and settlement of Melsetter is still young, and there are a number of trekkers who first came into the land to possess it still alive to tell the romantic tale of their adventures. As in most stories of colonisation these early days were times of hardships and disillusionment. The immigrations are still spoken of as the Moodie's trek, the Edenburg trek, Labuschagne's trek, Martin's trek, and the Steyn's trek. One of the first spots to be occupied was the Mission station at Mount Selinda, the site being granted, together with 12,000 morgen of land by Mr. Rhodes. During the years 1894-6 several venturesome spirits came up into Gazaland to spy out the land, and found it one of such good promise that in the course of the next couple of years they, with their oxen and asses, men servants and maid servants and all that they had, crossed the wilderness like the Israelites of old and came to a land overflowing with game and water, if not milk and honey.

Each trek in turn came up from the South, by way of Tuli and Victoria, across Mashonaland, and on the way lost most of their livestock and much of their provisions and supplies; while many fell out by the way and deserted. By a severe process of natural selection the fit survived, but the first few years were hard. Many lived by shooting game for meat for themselves and to barter for other foodstuffs with the natives. In succession other parties found their way up imitating in a small way the successive waves of population that have at different epochs swept over Europe and Africa, spreading population and civilisation, and taking the land to occupy it and develop its natural wealth. Some returned disappointed, like the back draught of a wave, others, after obtaining title to the land have left the district, which is the poorer for these tied up and derelict farms, but many stayed and made a home for themselves and for future generations.

A subsequent historic incident of considerable local importance was the decision of the two International Boun-





Melsetter Township in 1899.



A corner of Mr. Swynnerton's Rubber Plantation, Gungunyana, Melsetter.

dary Commissions which arbitrarily divided the country and threw several established farms into Portuguese territory.

Hardly were these pioneers established, living a primitive live entirely cut off from access to the outer world, than the pestilences which twice swept over most of Rhodesia, came upon them and almost wiped out their cattle. War and rebellion did not come among them, but the effects of these they felt, and the people were reduced to extreme poverty and straits. Transport in those days was a profitable if risky venture, and many turned to this means of livelihood before the railway was completed between Beira and Salisbury, and many still try to eke out a living this way when the curveyor can no longer look to acquiring wealth. It is noticeable how transport riding and good farming are antagonistic, and the latter is not found where the former is pursued. That the fertility of the land and other favourable conditions of nature cannot lead to prosperity without the economic factors of accessibilisy to market is well demonstrated in Melsetter. The construction of a good road into the centre of the district from Umtali has been a great boon, but there still remains room for further development of this sort. Remote from mines and far from the railway, Melsetter possesses no market for bulky or weighty produce, such as mealies, and grain, or oathay. The population has been obliged to become very self-supporting and independent. To get ready money and meet obligations, many farmers are compelled to ride a few loads in the year from Umtali, but the requirements are small, prices cut, roads at the best very difficult, and the farm suffers in the absence of its owner. Hopes centre on the ultimate construction of a railway in connection with the mineral deposits of the Sabi valley, but meantime the construction of roads, making of cuttings on hill sides and drifts on the rivers is the vital need of the district. Nothing would add more directly or materially to the welfare of Melsetter than the improvement of the one existing road and its extension to the southern part of the district. On the other hand, few districts, if any, are in a position to respond more to such increased facilities, for none is more fertile or potentially productive.

Northern and middle Melsetter consist of a confusion of mountains and a labyrinth of valleys without any recognise-able backbone or summit. Occasional rivers, such as the

Umvumvumvu, Inyanyadzi, Tanganda and the Lusitu break through, running west to the Sabi or east into the Mozambique Company's territory. These and numerous other streams are never dry, and though flooded during the wet season, are seldom impassable for any length of time, resembling more the brooks and rivers of Europe than the average African spruit. South of the Lusitu the general character of the country is rolling, not unlike English downs with occassional mountains and open plains. This part is lower and falls gradually as one travels southward, to the west to low semi-arid bush veld and to the east into the tropical jungle of the coast. Whilst Northern Melsetter is covered for the most part with bush, at times dense, and at times sparse, middle Melsetter is comparatively bare with low timber in the kloofs and occasional gwashas or clumps of higher trees of almost tropical appearance. To the south there are wooded belts, but the country is for the most part open whilst along the western edge low dense scrub covers the hills and fills the deep and narrow gorges. Rainfall and veld fires have been the controlling factors in regulating the occurrence of forests. Forest is hardly an appropriate description for the mean scrub which in some parts extends over hill and dale for many miles, elsewhere is restricted to the kloofs, or is even occasionally entirely absent. The most frequent trees are the M'sasa, Moura, bloodwood, corkwood and Mohobo-hobo, but it is seldom that any of these yield timber to speak of. One noteworthy exception however occurs for throughout Northern and Central Melsetter we have the Milanji Cedar and Callitris Whitei. These trees are still numerous, and some are from two to three feet in diameter and the wood most valuable. Large trees of this and other sorts, perhaps vestiges of former widespread forests, occur in protected places. The Mount Selinda forest, although only about 600 acres in extent, and the neighbouring fragment on the Umzila farm, together with a few similar patches across the border, present one of the most interesting and remarkable phenomena of nature in Rhodesia. In a country devoid of true timber forests and surrounded for hundreds of miles by flora and fauna of totally different appearance, we find a clump of trees shewing all the characteristics of the mighty forests of tropical East Africa, the nearest of which are to be found beyond the Zambesi; great monarchs of 150 feet in height and many centuries in age, tall and straight, thick

barked giants of ten and twenty feet circumference, festooned with moss and creepers, in many cases close wrapped by parasitic trees of the fig family of equal magnitude, which sometimes have entirely replaced their former host and now continue to grow independently. Much more imposing though reminiscient of the forests of Knysna and Natal, the gloomy depths and solemn grandeur of these sylvan recesses is truly magnificient, the more so in its entire unexpectedness. Here several exploring botanists have at times discovered great treasures, but none have paid greater attention to the plant, animal and insect life of this freak forest than Mr. Swynnerton who has made several discoveries therein of interest to science and has also studied the economic value of the timbers. The Department of Agriculture is indebted to the Mount Selinda Mission for a collection of wood specimens which have been sent to London for the opinion of experts. To Mr. Swynnerton we are obliged for the following notes on certain local species of trees. The Mahogany or Umbaba, Khaya senegalensis; the Umkuhlu, Trichilia diegeana; the Chirinda acacia; and the Umtoetse, which last grows to an enormous size and yields a latex, are worth plantink out for shade and ornament. Of exotics Mr. Swynnerton has tried very many sorts, but according to his experience, supplemented by that of others who have taken a keen interest in the subject, Dr. Thompson and Messrs. Longden, Gifferd and Sclater, the following are recommended: of gums, Eucalyptus siderophloia, Eucalyptus saligna, Eucalyptus botrioides, Eucalyptus viminalis (which grows fastest of any), and Eucalyptus resinfera; also Cedrus lusitanica (sic) Pinus canariensis, Pinus longifolia and Pinus taeda.

To pass now from the trees to the crops which grow in this remarkable district, it must be premised that present production is no criterion of what the district could produce, not perhaps next year but in two or three years time if reasonable prospects arose of a good market. It takes time to adapt farming operations to new conditions. At present of the bulkier foodstuffs, maize, oats, oat-hay, only enough is grown to meet local prospective requirements. Last year less than fifty acres of oats were grown in the whole district, and only five to ten acres of barley, barley-wheat and rye for green foaage. Wheat is more largely sown, mostly for personal needs, though a little is annually sent out to Umtali,

Last year upwards of 150 acres were grown which, at the low average of four bags per acre, is but 1,800 bushels. It is noticeable, however, that quite a number of farmers were taking up wheat, and that there is a prospect of a larger acreage being sown next year, especially if the projected grinding mills at Mutambarra in the north and Kenilworth in the south should become accomplished facts. The favourite wheat has in the past been "wolkoren," but it is very liable to suffer from rust, and "Medeah" has proved a better sort in localities subject to this disease and many have grown it for some years. Experimental sowings of Gluyas Early wheat have given most encouraging results, as it is more or less rust resistant and matures early, a great desideratum where the crop must be harvested before the rains break, while the meal is very superior to that of Medeah wheat.

Fruit wastes every season for lack of a market. No attempt has yet been made to take up fruit drying on a commercial scale. Owing to the fact that most fruit ripens in or about February during the rains, the use of drying ovens would be necessary, and as the crops are for the most part individually small, combination of adjoining farms or groups of farms on co-operative lines is desirable. A large supply for local consumption and possibly for outside markets should be feasible, as the fruit trees in the district must number many thousand. Citrus trees and bananas do extremely well, and the flavour of all fruit in this rich soil is remarkably full and sweet. As indicating the wonderful potentialities of the district, the following list comprises fruits found growing in two orchards, those of Dr. Thompson, at the Mount Selinda Mission, and Mr. Gifford, of Wolverhampton, many being found in both. Over fifty distinct sorts and a hundred varieties is a record which speaks for itself: Oranges, lemons, limes, naartjes, tangerines, grape fruit, apples, pears, quinces, plums, Japanese plums, greengages, nectarines, apricots, peaches, loquats, guavas, medlars, custard apples, avocada pears, mangoes, pawpaws, persimmon, pomegranate, pine apple, kei apple, tamarind, tree tomato, figs, cactus pear, bananas, grenadillas, melons, chou-chou, grapes, mulberry, strawberry, wonderberry, loganberry, raspberry, Cape gooseberry, walnut, hickory-nut,



A corner of a Melsetter Coffee Plantation.

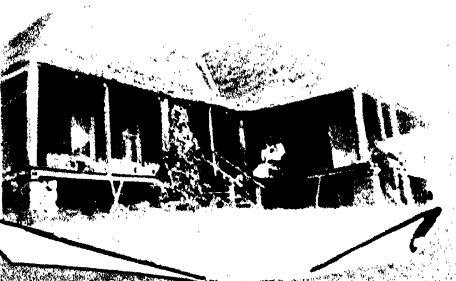


Native women cleaning Coffee Berries.









peccan-nut, almond, amatungulu, amangana, mugibi, maungu Hottentot fig, roselle, and ziziphus.

The slow transport and the rough roads preclude the possibility of fruit being saleable fresh, while preserving by the use of sugar is, on account of the cost of the latter commodity, equally prohibitive. It would, moreover, be difficult to arrange any system of rapid transport of fruit, as this cannot be guaranaeed in quantity, except during a brief period of the year. Other perishables, such as vegetables and butter, are cheaply produced, but are also unsaleable for lack of outlet. The sweet potato grows to perfection, also the yam, of which Dr. Thompson, at Mount Selinda Mission has grown several foreign varieties with complete success, and distributed them freely to friends and neighbours. The mission has served in many ways the purposes of an experiment station, or jardin d'acclimatisation, and besides the fruits already mentioned, various crops are tried. Ten different sorts of manioc or cassava have been grown, and all do well, and tapioca is at times actually manufactured by the ladies of the mission for domestic use. This is a useful plant, the value of which to Rhodesia has by no means yet been adequately tested. Pine apples have been grown in quantity, but abandoned for want of markets. Melsetter is the only district in Rhodesia at the present time in which coffee is cultivated commercially, but as there are upwards of twenty farmers growing it, and sixty acres under coffee, representing roughly 40,000 coffee trees, and as the acreage is extending, and as more trees come into bearing, the production is increasing, there are good grounds for saying that the crop is an established one. The ready local demand enables but little to be sent away to Umtali, but there is good reason to think that in time Melsetter will supply Rhodesian requirements, and perhaps more. There is a large area on which coffee can be grown. A small plantation is doing well on Rocklands, six miles from Melsetter, but the coffee belt par excellence begins south of the Lusitu River. Aspects facing the south-east or any spot where frosts might occur is unsuitable. Otherwise any land of reasonable depth commanded by an irrigation channel and warmly situated will serve. Some coffee is grown on old bush ground, but it appears to thrive equally well on bare land. The ordinary rainfall is generally, but not invariably, supplemented with

irrigation during the dry season, and the furrows between the rows that serve as drains during the rains may be used for water leading at other times. One other essential for coffee culture is an adequate supply of kraal manure. Of this there is generally ample, but in quality and quantity it might be much improved if bedding, straw, mealie stalks, old grass, and so on, were used to absorb the surplus moisture which in this climate is apt to wash out and impoverish the manure. The tillage operations connected with coffee cultivation present no difficulties to the average farmer, and where, as here, the natural conditions are favourable, it is to be regarded as a very remunerative crop. Picking the berries is light labour, for which mostly girls are used, paid by piece work. As yet the method of cleaning the berries is somewhat crude and slow, though effectual, and this subject deserves more attention than has yet been given to it. Boring beetles do some damage, especially if not watched for and caught at the commencement, but there seems as yet to be no sign of that scourge of coffee, the dreaded leaf disease, Hemileia vastatrix, which has ruined the industry in other countries. Local coffee fetches 8d. and 10d., and even 1s. per pund, and as the cost after establishment is small and the life of a tree runs up to forty and fifty years, while a fair yield is at the rate of one pound per tree per annum, and often more, there is reason to be sanguine. Mr. Dierking, whose plantations are just over the border in Portuguese territory, has grown coffee consistently for a number of years and has more experience of it than most in the district. He estimates a yield of a thousand pounds per acre from mature trees. On the Rhodesian side, Mr. Swynnerton has more coffee trees than others, though he only went in for the crop in 1901, and is well satisfied with the results. The credit of first bringing coffee seed to Melsetter is given to Mr. Martinus Maynard, of Merino, who obtained some seed at Chimoia in 1895. This he planted and raised thirty-six trees, from which seed was distributed two years later. Mr. Hulley, then of Hartebeestnek, took a keen interest in the matter from the outset, and got not only some of this seed but also some from Blantyre and from Waterberg in the Transvaal, including some Jamaican seed, the trees from which are still recognised by the brownish tint on the leaf, but which have proved inferior to the original importations. Mr. Swynnerton also raised seed from Nyasaland and from Inhambane for trial

purposes. There is room for improvement in the methods of pulping and treating the berry, and a number of samples from different types of soil and from different situations have been sent to London for examination and report with a view if possible, to affecting improvements and ascertaining whether any locality produces markedly superior coffee.

Passing now from crops to matters concerning livestock it may be said at once that for cattle the veld is some of the very best in Rhodesia. The district suffered severely both from rinderpest and from African coast fever, breeding stock being almost wiped out, but to-day the European-owned cattle number something over 4,000 head, of which far the greater number are bred in the district, although stock brought in from across the Sabi has also done well after it has become acclimatised and used to the cooler, moister air and higher altitudes. There is a considerable trade in slaughter cattle to the Umtali mines. The cattle are mainly of native origin, though on some farms the influence is still clearly seen of the superior stock brought in from the southern colonies by the voor-trekkers. A very obvious want, more strikingly apparent to the visitor than to the resident perhaps, is the great need of better blood. Everything is favourable, veld, climate, water, health, and the pasturage is capable of supporting a more productive and profitable stamp of beast, especially if bred from the present cows as foundation stock. The use of bulls of a well defined beef type like the Hereford with reversion to Afrikander strain to regain hardiness at times seems advisable, an example being ready to hand for demonstration purposes in the results of the use of a bull of the breed mentioned on the farm of Mr. van der Riet on Thabanchu in the Umvumvumvu valley, half way between Melsetter and Umtali. At present the district is remarkable for the absence of good bulls, although a number of cross-bred animals of local repute are to be found, chiefly of Friesland strain, many being descendants of one sent to the district by Mr. Rhodes.

The position of small stock farming in Melsetter is that it has been proved by demonstration, and repeatedly, that the veld is admirably suited for sheep and goats, and that excellent Merino wool is produced. Native and Boer goats do well and experiments with Angoras have been begun by a

few progressive farmers and so far with fair promise. In spite of these facts the great majority of flocks are in a bad state and in many instances are dwindling down. The chief cause of this regrettable state of affairs is undoubtedly wire-worm, the nature and treatment of which were discussed lately in a comprehensive article in this Journal by Mr. Jarvis, M.R.C.V.S., who indicated clearly that systematic dosing and removal to clean veld is the simple and effectual means of curing the trouble and eliminating it from the district. Scab, too, is fairly prevalent, and recently two portable dipping tanks have been sent down to enable farmers to cleanse their flocks and to remove every pretext for its continuance. Both these maladies are quite curable by means well known in more advanced sheep farming countries, and with them under control, there is no doubt that there is money in sheep at Malsetter. It has been calculated that there are about 400,000 acres suitable for merinos in this district. Where proper care is exercised and reasonable luck enjoyed the rate of increase in small stock is truly phenomenal. Mr. Jansen of Fortuna was able to give figures bringing this out clearly. In the year 1904 he bought three hundred sheep and goat ewes, and from wire worm lost the whole crop of kids and lambs, and one hundred of the older ones. From the two hundred left he has now in four years a flock of eight hundred, and has sold two hundred and fifty fat sheep off the farm, besides those he has slaughtered for his own use. A similar instance is that of Mr. Hans Steyn who, when he trekked in 1894, brought with him five merino lambs, from which without purchase and with losses from various causes he had in ten years a flock of over a hundred, whilst Mr. Stoeffel Steyn in the same time has the even more startling increase of from one original lamb to forty sheep. If every one had done as well, the district would be teeming with stock.

While the merino seems to take kindly to the herbage and climate, the Persian sheep, as was to have been expected, have not taken to the climate. They are essentially intended by nature for arid climates on the verge of the deserts and in their natural habitation, Northern Africa, from Algeria to Somaliland they are to be found only in such circumstances and give place in the well watered zones where forest and rank grass occur, as round Lake Victoria, the Abyssinian

plateau, and in British East Africa, to the brown sheep, not unlike the native sheep of Rhodesia.

The origin of most flocks was through the munificence of the Rhodes Estate, and but for the ravages of the diseases alluded to, their efforts would, no doubt, have proved most beneficial. To-day in the hands of white farmers there are some 4,600 sheep in Melsetter district, of which fully half are merino, and about 2,000 goats. A pressing need is the introduction of superior rams, for lack of which flock masters will yet have to pay more dearly, although more indirectly, than they would by now purchasing a good type of merino with dense and greasy fleece. Yolk would keep out the rain yet, owing to the relatively little dust, would not gather an undue proportion of earth as does such wool in the Karroo. The veld is capable of producing a large carcase, and mutton is likely always to be in demand in Rhodesia, where the staple form of meat is beef. Past efforts for combined purchases have for various reasons failed, but the purchase of good rams is none the less to be commended to the attention of those in Melsetter interested in the sheep breeding industry, which is now struggling to establish itself, having passed well out of the experimental stage, although still in a somewhat precarious condition and capable of much extension and bettering. Tigers commit at times serious depredations to small stock, particularly should they get into the kraal at night and start killing right and left. The similarity of middle Melsetter with portions of the Highlands of British East Africa is striking. The latter region has, after some vicissitudes, come to be recognised as good sheep country, and the native black headed, lopeared, brown haired, fat tailed sheep has been crossed with rams of English meat breeds and with Australian and South African merinos and with the Kerry Hill, itself a cross meat and merino breed, resulting in the course of a couple of generations in the production of really high class combination of mutton and wool with native hardiness.

Native labour is abundant or deficient according to circumstances. Certain farms are favoured by natives, especially the warmer or well bushed localities, and some farmers enjoy excellent reputations amongst the natives, whilst others are avoided. Farms surrounded by vacant places suffer a shortage. The terms vary much: usually 10 weeks per

annum spread over the year is levied without wages in lieu of rent; elsewhere, no rent is charged and 10/- per mensem is paid in wages. On some farms the kraals supply what labour is required, on others "volunteer" labour has to be depended upon entirely. To youths 6/- is paid, and 10/- to 20/- to adults, generally without rations.

If any material development of the district takes place there will at first be some difficulty in getting labour, but as the privately-owned but unworked farms become fewer, things may be expected to straighten themselves out according to the laws of supply and demand.

One consequence of the manner in which the country was taken up is that they still speak of the north-eastern portion of the district as the "Steyn's trek," for here Mr. Johannes Steyn established himself in the earliest days, and in spite of losses and misfortunes occupies a fine farm and has provided one to each of his seven sons. As stated, this part of the country is mountainous and steep, best adapted for cattle and sheep. In the centre lies the patriarchal home appropriately named Johannesrust, where mealies and wheat and oats and fruit for little more than domestic needs are grown, the increase of wealth being measureable by the livestock, seldom killed or sold, and which but for the devastations of contagious diseases would long since have been as numerous as the veld could carry, for the increase is rapid and satisfactory and a man can reckon on having a beast whenever he sees a calf. The ready money for the needs of the household is drawn from the poultry, which are carried by boys to the Umtali market 63 miles away. A load, it may be mentioned, is carried for five shillings, and consists of 25 dozen eggs or a coop of live fowls. An ample water supply led out of the mountains feeds a garden of a thousand or more trees in which is found a great variety of vegetables and fruit in its season. Similar to this, but with variations in detail, there are a dozen farms or more, all unfortunately under-stocked but on the high road to prosperity if but protected from further devastation. Hairworm and blue tongue and scab still trouble the small stock, but the remedy lies to hand for those who will use it. Similar land lies to the north just within the Umtali district, to the east in Portuguese territory, and to the west where it drops in terraces to the

Sabi valley. In that direction land has lately been occupied by Messrs. Hulley and King. While much drier, it is also warmer and more sweet, while the occurrence of lime-cliffs has led to the establishment of an industry for the purpose of supplying an excellent quality of quick-lime to Umtali, some fifty miles to the north. On Mr. Hulley's farm the water is being taken out, and owing to the calcareous nature of the soil lucerne is doing well, an unusual and remarkable circumstance in Rhodesia.

In 1894 the "Martin's trek" settled further south round where Melsetter village now stands, and to-day Mr. J. L. Martin owns a block consisting of the farms Rocklands, Clifton, Westfield, and Dunblane, where from one to two thousand cattle and perhaps five thousand sheep could find grazing the year through—tenfold of what are there to-day. On Rocklands a couple of hundred acres of fine red soil are under the plough, yielding eight bags or more of mealies to the acre. On this farm 200 coffee trees are in bearing, a fact of much significance as to the future extension of the crop, for it lies at a much high higher altitude and far removed from the coffee zone as generally recognised. Along side this essentially tropical crop an experimental patch of rye, a cereal which extends right up into sub-arctic regions, has done well and proved its suitability to this region also. To the east of these farms rise in majestic grandeur to the height of 9,000 feet, ridge upon ridge of bare rock, the mighty precipices of the Chimanimani mountains, the central mass of the Melsetter ranges and the frontier of Rhodesia. To the west and south for twenty miles lie perhaps fifty farms of a similar nature: twenty-five to thirty-thousand acres of magnificent stock country, including short grassed plateaux and airy summits, great stretches of mountain side, sheltered and bushy kloofs, sweet, sour, and mixed veld, with abandance of water and no period of scarcity. On every farm there is room for a hundred acres of land partly irrigable. This is central Melsetter, and there are perhaps thirty occupied farms, in several instances one owner holding more than one, whilst a round half dozen, including some of the best, are lying unoccupied although held by private owners. To the south a splendid group of farms: Dunstan, Tilbury, Springfield, Rumble Rills, Hayfield, and Tarka, together 27,450 acres, belong to Mr. English of Umtali but these are, it is gratifying to observe, beneficially occupied. This

property is being stocked with good cows, and bulls have been brought in to grade them up, so that ere long it should develop into a capital stock farm with dairying, perhaps cheese making, as a specially strong feature. Similarly on Mr. Longden's farm Sawerombi, managed by Messrs. Oxenham and Hoad, where already there are about 800 head of cattle and 800 small stock, there are possibilities, amounting to a pressing need in the early future, for the utilisation of the surplus milk on a large scale and systematically. Any good cow, certainly any cross-bred and improved cow, should and does on such veld give more milk than her calf requires, and it is harmful to the individual and prejudicial to the heriditary milking qualities of the herd to fail to relieve her of this excess. On Bloemhof, again, Messrs. Ferreirra and Markham have a couple of hundred cattle and seek a market for their butter. To mention each farm would be but vain iteration; let it suffice that there are a number of other farmers, many with only a few head of horned stock left to them after the coast fever, where now the cattle are multiplying and bid fair in no very distant time to justify the belief of the inhabitants in the possibilities of the region; although meantime the process is necessarily so slow that some cannot afford to wait.

Across the Lusitu one enters a somewhat different world, lower, less traversed by deep valleys and high ridges, but still hilly and covered with good grass, well if less plentifully watered, still mainly consisting of pink and grey sandstone rock. Sheep thrive, but the country is not so suitable to small stock as the northern parts of the district; fruits grow to perfection but are more attacked by insect pests, frost is rare and the climate warmer though very equable. The rainfall is heavy to the east—45 inches or more per annum—but dwindles away to almost arid conditions as one passes over the western escarpment into the Sabi valley. Some of the very first farms to be occupied lie in this part of Melsetter first entered by Moodie's party after many adventures on Christmas Day, 1892, from the west by way of Moodie's Drift and the descriptively named Driespansberg, the mountain up which the road winds from the Sabi valley to the high veld.

The farms Waterfall, Fortuna, Chipinga, and Kenilworth were among the first selected. The last-named was recently

sold to a member of the latest trek, that of the four brothers Joubert, who came into the district from the Free State only last year, and who have taken up that farm, Groenvlei, Schaaplaats, Sterkstroom, Merrywaters, and Joppa. There is still room for settlers, although farms are not so easy to get as once they were, and empty farms with absent proprietors remain as blots upon the landscape. For many years the Moolman family has occupied Nooitgedacht, Voorspoed and other farms in that vicinity, which have the settled air and appearance of districts in the Transvaal or Cape Colony. At Morgenzon, Mr. E. P. Kruger has done much to improve the place. Favoured with fertile red sandy loam and an excellent water supply and adorned with plantations of gums, wattles and bananas, and a fine fruit orchard, this is a good farm and possesses a superior homestead. As elsewhere, a minimum of maize is grown for domestic needs, but coffee has been grown for a number of years, and the oldest trees in the district are to be seen here, bought from Mr. Hulley at a shilling each twelve years ago. There are now twelve hundred coffee trees in the plantation some quite young, and the last harvest yielded 1,500 lbs. of clean coffee which, even at 8d. a pound, forms a useful addition to the income of the year. Close to the border lie the fine farms Wolverhampton, Wolfscrag and Knutsford, the property of Mr. A. S. Gifford and a striking example of what can be done in the district. Mr. Gifford came in in the early days, chose this place in 1894 and has from wild and barren veld turned it into a productive arable and pastoral farm, beautified it with upwards of 11,000 ornamental trees and 500 fruit trees, laid out gardens, put up fine kraals and stables and 1,000 yards of wire fence—a consideration at 140 miles from the railway; consiructed an up-to-date dipping tank, made roads to different parts, and spared no pains to develop, improve and embellish the estate. To the great variety of fruits and the interesting experiment with trees reference has already been made, but here it deserves mention that besides mealies and kaffir corn, for years past Mr. Gifford has been growing for his own needs wheat, rye, barley, barley wheat, Cape oats, Algerian oats, Chinese huskless oats and rye, probably a record of its kind in Rhodesia. A couple of hundred cattle, of a superior class to most, run on the farm, for Mr. Gifford was fortunate in escaping the last outbreak of disease. This delightful home

is a striking picture, confirmed as it is by a few other examples in the vicinity, of what might have been the general condition of Melsetter had prosperity smiled on it from the outset, if all had worked as some work and if no farms had fallen into the hands of absentee owners, the drones of our economic system. Surrounding Mr. Gifford's farm are a number of others where progressive agriculture is the order of the day. Coffee has done well here on land which was originally grass veld, not old bush land as is generally recommended. At Vermont, Mr. J. W. Scott's farm, the first crop of coffee was recently gathered from 1,600 trees and amounted to 1,200 lbs., while 1,000 more trees are being planted. The soil is well adapted for tobacco growing, indeed this portion of Melsetter is recognised as possessing some of the best tobacco land in Rhodesia. Experts have at different times expressed themselves in terms of the most unqualified praise of the possibilities of tobacco, particularly in Southern Melsetter and also in parts of North Melsetter though not there to the same extent, and both for cigar and cigarette leaf. A few of the farmers have taken it up, but the fringe of the possibilities in this direction have hardly been touched. On Mr. Meikle's farms at Uitkyk and Albany active progress is being made, though unfortunately two years' crops stored at the former place were entirely destroyed, along with large quantities of grain, coffee, and forage, by a terrific veld fire which, driven by a violent wind, gutted and demolished all the farm buildings in the course of a couple of hours. Mr. Brent, of Eastleigh, is perhaps the foremost tobacco grower. He has erected an up-to-date flue curing barn and grows forty acres of Virginian type, while Messrs. Stanley and Miller near by are likewise making a serious attempt to grow tobacco and are also making a successful feature of bacon. Mr. Sclater, the secretary of the very active Gazaland Farmers' Association, has a good farm—Helvetia—adjacent to these with 1,500 coffee plants, the last crop from which was 700 lbs. Mr. Sclater has achieved success in growing carrots and Florida velvet beans, which goes further to prove the many possibilities of the district.

At Chipinga in the centre of Southern Melsetter, there is a long, low, raw brick, thatched building, of rustic simplicity of design and innocent of all architectural pretensions, but

of interest as being the first and, till quite recently, the only Farmers' Hall in Rhodesia, built by the members of the Gazaland Association as a public meeting room, and in which the discussion of matters of local interest customarily last from six o'clock in the evening till long past midnight, once in three months.

Round the Police Camp there are a number of farms, and it is noticeable how many of the recent settlers have chosen land in this part. Further to the south the country gradually flattens and falls, and is covered with dense bush. At a point 65 miles from Melsetter a group of farms is met with, the centre of which is the American Board Mission at Mount Selinda, where the value of industrial training is recognised, and brick and tile making, carpentry and building, as well as farming work is taught and carried on. The gardens and forest have been mentioned, but all the crops grown in the district are cultivated, rendering the mission to a considerable extent self-supporting for the principal articles of food. Just through the Selinda forest Mr. Swynnerton has been farming and experimenting for some years, so that to-day Gungumyana may fairly be described as one of the most remarkable and interesting farms in Rhodesia. Besides 15,000 native and foreign trees planted out and all manner of fruits, Mr. Swynnerton is the largest grower of coffee, having about 8,000 trees, none under irrigation, which is necessary anywhere else during the dry season. Whilst something has been heard at different times of rubber companies and concessions in the Sabi valley, the credit of making a real effort to cultivate and produce rubber must be accorded to Mr. Swynnerton, who commenced operations in 1902, and has now got material evidence as to the possibilities in this direction. His main plantations consist of ceara rubber, uanihot glaziovii, the same sort that is the principal species in German East Africa. Growth has been slower than in the lower and more intensely tropical regions round Tanga and Pangani, on the coast opposite Zanzibar, where the writer has seen rubber grown, but this apart, the trees seem vigorous and healthy, and have every appearance of yielding rubber profitably. The soil is a rich red loam on a slope facing north, the spot is virtually frost free, and the rainfall somewhat over 40 inches per annum. These conditions are rarely met with in Rhodesia, certainly not along the higher parts now most fully occupied.

The trees have just reached a tappable size, and it is hoped this year to obtain some return for the years of patient waiting. Another interesting experiment Mr. Swynnerton has made is planting the indigenous wild rubber Landolphia Kirkii at the foot of every native tree in a portion of the Mount Selinda forest, which comes into his property. Although slow growing, taking from 20 to 25 years before they can be tapped, there is little doubt as to the ultimate success of this idea. Such opportunities, however, are unique. Some landolphia planted in conjunction with artificially propagated native trees bid fair to do very well, and this idea offers a much wider field for the development of the native rubber. While on the subject of this wild rubber, it may be mentioned that small quantities of it are collected by the natives and brought to the storekeepers. It is classed in the trade as "pink Beira." It is not generally known that the fruit of this Landolphia Kirkii is gathered and eaten by the natives and sold to the Europeans, who find that it makes a palatable and somewhat uncommon preserve.

A third farm onto which a portion of the Selinda forest extends in Houtberg, the property of Mr. Odendaal, where wheat and maize, coffee (3,000 trees) and tobacco, oranges, apples and mixed fruits are all doing well and testify yet again to the peculiar and favourable conditions of this country. Timber of good quality for household purposes and wagon wood is cut in the forest, but the demand is limited fortunately, else this beautiful and interesting forest would probably ere this have been ravished, whereas as yet but trifling injury has been inflicted. On several other farms in this vicinity coffee is doing extremely well, as with Mr. J. G. Raaths at Merino.

Further to the south the country falls gently and becomes more tropical, passing by degrees into the jungles of Portuguise East Africa. The last point permanently occupied in this direction is the farm and trading station of Mr. Ballantyne at Jersey, where the grass grows up to fourteen feet, and dense enough to hide a tent waggon and oxen, a striking difference to the grasses on the mountains, which do not rise as many inches. Though warm, this is a very fertile tract with possibilities for some good farms, but it is, and must long remain, one of the most remote confines of the territory.



Waterfall near Melsetter.

Such are the farming conditions of the district, with all its drawbacks of distance, rugged wildness, and lack of market, and with its advantages of climate, soil and water supply. The proven possibilities for the growth of a remarkable diversity of crops of high value and its recognised suitability for large and small stock, give assurance of a prosperous future, and it requires little imagination to foresee before long a greatly enhanced production of meat and milk, grain, forage, coffee, fruit, tobacco, and other products, so that both scope and security to industrious enterprise are assured to the Melsetter farmers.

The Second South African Irrigation Congress.

[CONTRIBUTED.]

While it must at once be conceded that the hydrographic conditions of Rhodesia are very different from those of the Cape, and materially different, though in a less degree, from those of the Transvaal, yet it must be recognised that much may be learnt from the experience of the older colonies and that the words of wisdom spoken at the recent Congress of irrigators deserves careful study by us and application to our circumstances. To this end we publish extracts from some of the papers read, regretting that space does not admit of fuller quotation and realising that they necessarily lose somewhat in being shorn of their context.

IRRIGATION DEVELOPMENT IN SOUTH AFRICA WITH STATE AID,

By C. E. KANTHACK, A.M.I.C.E., Director of Irrigation, Cape Colony.

"I will now state briefly what I consider the best policy to be pursued by Government in South Africa for the development of irrigation.

"First and foremost, the Government should carry out a thorough and systematic hydrographic survey of the whole country, the object of which, broadly speaking, is to collect accurate data about all the known supplies of water in the country, be they running streams, or intermittent; the run-off from different catchment areas; the location of underground sources of supply; possibilities for generating power and other similar matters. A hydrographic survey should be able to look to the department responsible for the collection of meteorological survey should be able to look to the department responsible for the collection of meterological data for a large measure of assistance, but this is unfortunately not the case in South Africa.

"Secondly, it is the duty of the State to aim at providing the most efficient system of water law, which, while respecting existing rights to the fullest extent possible, must be of a progressive, and, if I may say so, of a socialistic character. The laws of South Africa are based on those of the parent countries which are in no need of irrigation and water conservation. In a semi-arid country the water law must, so far as possible, aim at giving the greatest amount of benefit to the greatest number.

"Irrigation law must provide the most efficient machinery for developing irrigation, while at the same time safeguarding established interests. Machinery is also required for administering the law with as little expense to the farmers as possible. The Cape Water Courts aim at this, but, while I consider the principle sound, there is little doubt that the composition of these courts requires to be strengthened by the inclusion of special water magistrates, who should travel about the country and sit with the local magistrate and one assessor.

"Thirdly, following on the hydrographic survey the State should carry out systematic reconnaissance surveys with the object of discovering where and how the available sources of water supply can be utilized to the best advantage for agricultural or power purposes. Such surveys should work systematically through the main and subsidiary drainage areas of the country, and should demonstrate the feasibility, not only of large schemes but also the small ones on individual farms. Projects should be surveyed to a sufficient extent to prove whether schemes are good and practicable or not, and, if large comprehensive schemes are not possible for special reasons, alternative smaller schemes should be put forward.

The results of a reconnaissance survey should be intelligently put before the people interested, and where co-operative schemes are proposed every assistance should be given in forming irrigation districts. The projects which emerge from the reconnaissance survey should not be finished schemes with all details ready for immediate construction, but should be carried only sufficiently far to enable a fairly reliable project estimate to be prepared. Should the scheme be taken up by a board or by an individual the cost of sub-

sequent detailed surveys and of the preparation of plans, etc., should be defrayed by the parties concerned.

"Fourthly, in the early stages of development the Irrigation Department must be a bureau for giving advice on all matters bearing on irrigation, and in this respect must work in close touch with the agricultural experts. Irrigation should in fact be under the same Ministerial Department as agriculture, as otherwise the free and informal co-operation of engineers and agriculturists is impossible. The officials in charge of irrigation must be able to travel freely about the country, and, possessed with a sound practical knowledge of agricultural requirements, should be able to patiently explain to farmers how to carry out their schemes. They should look for new possibilities and act generally as missionaries.

In addition to this, practical assistance should be given at a nominal charge for the surveying of small schemes, alignment of furrows, selection of sites for dams, and the working up of engineering details. This kind of assistance is of the utmost importance in the early stages of development, and it is of a kind which will be readily sought and acted on when supplied by the engineers of the department at a small fee, when the farmers have once gained confidence in the irrigation staff. This they readily do if the staff is competent, tactful, and enthusiastic. At the same time such advice cannot be readily given at reasonable fees by engineers in private practice, and unfortunately there are men who try and practice amongst the farmers who are by no means competent to give advice.

"Where assistance from the Government is sought to carry out extensive surveys the fees charged should be such that competent engineers in private practice may compete for that class of work.

"It is essential that farmers should be able to get advice or professional assistance promptly and without official formalities or "red tape," and the staff entrusted with advisory work must be very easily accessible, and should be able to settle all formalities personally with the farmers direct. I have known farmers to prefer making mistakes through acting by themselves rather than starting a correspondence with headquarters about obtaining the services of an

engineer.

Fifthly, farmers and others desirous of carrying out irrigation schemes of an approved character should be able to obtain money on the easiest of terms from the Government, due regard being paid to security and efficiency of the work to be constructed. With regard to the security the enhancement in the value of the land to be irrigated should be fully taken into account, be it as the enhanced valuation of land to be mortgaged, or by accepting irrigation rates leviable by an irrigation board as security. If this broad view is not taken the owners of many of the farms in most need of improvement by means of irrigation will never be able to raise the necessary capital for the carrying out of the works. At the same time I do not favour the acceptance of anything but really first-class security, and in judging security the life of the loan must be considered. Thus I do not think the exaggerated land values now obtaining in Cape Colony should form the basis of a loan granted to-day which is to run for fifty years. The permanent and intrinsic value of a property must alone be considered.

"Irrigation loans can only be granted for the construction of works or the purchase of plant. It is, however, very necessary to supplement these loans by small agricultural loans for land development, etc., as it frequently happens that a man who has carried out a good irrigation scheme under a Government loan finds he cannot make proper use of the works owing to his inability to find the necessary capital for the development of his lands. Agricultural banks are the best agents for meeting this difficulty, as I do not consider irrigation loans should go beyond the limits of irrigation works themselves, experience having shown that the control of expenditure by applicants becomes almost impossible.

"Sixthly, the Government should establish experimental stations or farms at a number of representative places where the most efficient methods of dealing with local conditions of climate, soils, topography, and water supply can be properly experimented with and demonstrated. This should form part of an organised system of agricultural education and research. This branch of State activity I consider most necessary, as, in the first place, South Africa is to a large extent an arid

and semi-arid country, and every effort must be made to make the very fullest use of our available sources of supply, and in the second place, bad methods of irrigation, be they the use of too much or too little water, or badly laid out lands which cause deterioration of the soil through the rapid leaching out of plant food, or akali and other troubles due to want of drainage, are all the causes of severe troubles, and may bring ruin to individuals and even to districts.

"Finally, the State must look closely to the conservation of its sources of supply by protecting the natural vegetation over the main gathering grounds of the streams. All the higher elevations of the mountain ranges which are the sources of rivers and springs capable of being utilized in tracts requiring irrigation should be under the most rigid protection. Afforestation is excellect where it can be profitably done, but in the Cape Colony most of the great ranges, such as the Zwartbergen, Langebergen, and Cederbergen, are not suitable for afforestations. These mountains will, however, if protected from fire and lopping maintain a heavy growth of bush and grass which is capable of retarding the run-off considerably, and maintaining the perennial flow of streams and springs.

"The above-mentioned lines of action indicate merely a skeleton of the policy which I consider is the best one to follow in South Africa for some years to come. In the Cape Colony it has in a large measure been followed in recent years to the extent possible during a severe financial depression, and the results of this policy have clearly shown its unquestionable merits.

[Regarding the above six points, it may be explained that in large measure they are intended to be conducted simultaneously.—ED. R.A.J.]

ACTUAL RESULTS—IRRIGATION, EVAPORATION, AND DRY-LAND EXPERIMENTS IN CAPE COLONY

By R. W. THORNTON, Government Agriculturist, Cape Colony.

"Since 1906 carefully supervised irrigation experiments have been conducted in Cape Colony; at first on the Robert-

son Experiment Station only, but during 1908 in other centres as well, on different soils and under different climatic conditions. The experiments have up to the present been confined to the four cereal crops, wheat, oats, barley, and rye, and to our principal fodder crop, lucerne.

"1906-7 *Experiments.*—The experiments carried out in 1906 were of the simplest, but a simple beginning was necessary, as there was absolutely no information available at this date which could be used as a basis for future experiments. The experiments were, first, to find out what amount of water on the average constitutes a wetting as applied by the farmer, and what number of wettings, and consequently what average total amount of water the farmer applied to his principal crops. To determine this point was a comparatively simple operation, involving no deviation from ordinary farm practice, except the careful measurement of the ground under irrigation and of the water led on to such ground. The crops in the experiments under discussion were given water at such times and in such amounts as they appeared to require it, and the records obtained show that lucerne under a permanent supply of water received 40 to 43 inches per annum, the average wetting being about 5·35 inches, whereas cereals under similar circumstances recived from 17 to 25 inches, each wetting being about 4·35 inches. These figures include the rainfall and, in the case of cereals, the preliminary wetting.

"1907-10.—Having once ascertained what amount of water was actually being used by the average farmer, exhaustive experiments were arranged and have been carried out constantly from then up to the present date, in order to ascertain the effects of scanty, ample, and excessive irrigation, the variation in the water supplied being from 8 to 32 inches in the case of cereals, and 16 to 40 inches in the case of lucerne.

"Not only the result obtained but also the method of application of water to the crop and the manner in which the water is applied have an enormous effect on the yield. The first four plots each received only two wettings of different depths, the next four each three wettings, and the remaining four each four wettings, exclusive of the preliminary wetting which was given prior to ploughing. Plot No. 10, which

received one 4-inch and three 3-inch wettings, gave the maximum yield, yet plots 11 and 12, which also received four wettings, gave the minimum yields, the decrease being evidently due to the fact that *too much* water was applied to 11 and 12. Plot No. 6, which received three 4¼-inch wettings, gave the second highest yield, and plot 1, which received two 4-inch wettings, gave the third highest yield. From this it will be seen that the method of application is as important as the actual amount of water applied, and it is also clearly shown that anything over 21 inches tends to reduce the crop enormously. In fact, 32 inches of water in the result only produced a little over 50 per cent. of that produced by 21 inches, while the amount of grain was diminished to an even greater extent. One of the principal features of the results of these experiments is the fact that the variation in the yield obtained from respective crops of wheat, barley, oats, and rye receiving 16 inches to 21 inches of water, if suitably applied, is not great. This result has been verified by repeated experiments during seasons that varied considerably, and it may therefore be stated that, when arable land in plenty is available and water is scarce, the maximum yield from a given supply of water will be obtained by wettings totalling, say, 16 inches. If the maximum yield per acre is desired, however, a total of from 20 to 21 inches must be given.

"The results obtained from the wheat experiment are very similar to those of the barley, except that they show that wheat suffers even more severely than barley where subjected to over irrigation. The records of the last season's experiments (1908-09) show a fall of two-thirds in the wheat crop return from plot 11, which received a total of just over 32 inches. Up to the present the experiments conducted under varying conditions all tend to establish as the most suitable standard a total water supply of 18 to 21 inches, which should be applied in not more than four wettings of about 3—4 inches each.

"*Method of Measuring Water.* — The method employed during these experiments of measuring the water supplied was that of the Cipolletti weir, a simple notched board of special form and size. In using this weir the depth of water at the time occupied in its passing over the horizontal lip of the weir are ncted, from which by reference to appropriate

tables the quantity of water may be calculated. Vice versa the depth of flow being measured, the time required for a certain quantity of water to pass over can be reckoned, and that amount be put on to the land with tolerable precision.

THE VALUE OF IRRIGATION ON THE HIGH VELD

By THE HON. A. G. ROBERTSON, M.L.C., President Transvaal Agricultural Union.

"We are favoured by an annual rainfall which, I think I may venture to say, averages something like thirty inches, the country is far from being overstocked, and, in the summer months, our pasturage is far more than sufficient for our flocks and heards.

"I have said that the yearly rainfall is heavy as compared with other districts which lie to the south-west of the Transvaal, and I should like to add that, roughly speaking, that rainfall is spread over a very limited period in each year. In addition to this fact I wish to point out that rain falls only on a few individual days during the six months from November to April, and also that, on occasions, three or four inches of rain may fall in a few hours. From May to October we have, generally speaking, a period of absolute drought, accompanied by dry winds of considerable velocity. To this may be added the fact that we suffer from very severe frosts, which sometimes register as much as twenty-six degrees. Thus you will see that the difficulty which faces the high veld farmer, in respect of the feeding of stock during the winter months, is of such a nature as pretty effectually to counterbalance the fact that this summer veld will carry two sheep to the acre.

"The present value of ordinary grazing ground on the high veld ranges from two pounds ten shillings to three pounds per morgen. That land, as I have previously pointed out, is valueless for some six months in every year, nor is it possible to make use of the surplus pasturage of the summer months for the purpose of feeding stock in the winter.

"New conditions demand that we should make the high veld farm a place where live stock can be kept throughout the whole of the year, and that the profit thereon should be

such as to bear some reasonable relationship to the constantly increasing value of land. This, I am disposed to think, can be successfully done only as we make a proper use of the abundant rainfull with which we are blessed. This priceless treasure, running as it now does on its useless course to the sea, must be utilized to the fullest extent which the skill of scientific men has made possible to the ordinary farmer. It must be utilized in order that we may be enabled to produce winter feed for our live stock, and so that we may devote our bushveld farms to other purposes for which they are better suited than that of grazing stock during the winter months. Tolthis end we must lay ourselves out to conserve our water supply, and I sincerely hope that the day is not far distant when we shall find no high veld farm without its well-constructed dam, great or small, according to the means of the individual owner and to the conditions which prevail for the erection of this necessary appendage to every farm. The high veld abounds with suitable sites, admirably adapted for the construction of dams varying in cost from fifty to a thousand pounds, and there is certainly a sufficiency of rain to ensure that they will be filled to overflowing from year to year. A dam, capable of containing some one hundred and fifty millions of gallons of water, has been built upon the property owned by my brother and myself, and its construction has cost between six and seven hundred pounds. The expenditure of this amount has enabled us to bring some two hundred acres of land under irrigation. We were most readily assisted in the work by our excellent Irrigation Department, and the services of the officials of that department are equally at the disposal of any farmer who wishes to avail himself of valuable advice.

"I know that I shall be told that the cheaper way would be to grow, in the summer months, such crops as can be preserved for winter use, and I freely admit that something can be done in this direction, but I am firmly convinced that no satisfactory solution of the problem will be found apart from the raising of green crops during the winter by means of irrigation. By green crops I mean such things as paspalum, winter oats, barley, and winter wheat. Some of these crops, such as oats and wheat, can be fed down two or three times during the winter, and will still yield a respectable grain crop in the spring of the year.

"The question has frequently been discussed as to whether it is possible to grow wheat at a profit under irrigation. There is a great diverstty of opinion upon this question, but it seems to me that there are many factors to be taken into consideration before a just conclusion can be arrived at. Much depends upon the character of the soil itself, upon the variety of wheat which is sown, upon methods of cultivation, and, not least, upon the cost of irrigation and its proper application to the crop. If I may be allowed to make a suggestion, it is this—economize in the construction of your dam in so far as economy is consistent with sound construction, make the fullest use of the expert knowledge which is so freely placed at your disposal, do not denude your land of the valuable soil which you may possess by careless methods in applying the water which you may have succeeded in conserving, and make your water do its "duty."

I am fully satisfied that owners of farms upon the high veld will succeed in greatly increasing the individual value of their holdings just as they bring suitable areas under irrigation. On farms where the irrigated lands have considerable slope, it may be found necessary, in order to prevent denudation of soil, to resort to a system of levelling. This will mean additional cost, but not to that extent which will deprive irrigation, carried out on sound lines, of its true value as an aid to the growing of winter foods for our stock."

TWO METHODS OF FARM IRRIGATION

By C. D. H. BRAINE, A.M.I.C.E., Inspecting Engineer, Irrigation Department, Transvaal.

"The proper handling of water in the field when irrigating —or leading, as it is often called in South Africa—is a subject that deserves far more attention from farmers and irrigation engineers than it has received in the past. I would impress upon you that the more carefully, and the more scientifically, you use water when irrigating, the better results you will obtain and, consequently, the more money you will make. The subject is one that should receive the earnest attention of every irrigator in South Africa, and I propose to draw your attention to two methods—flood irrigation and furrow irrigation,

Flood Irrigation.—Having levelled your ground, divided it into plots, and built banks round them, the next points to consider are the sluices for letting the water in and out, the quantity of water to use, and the rate of delivery. If the water comes in too slowly, it takes so long to spread that the top part gets more water than it needs and the lower part not enough. A large quantity is lost by evaporation : There is a waste of water and a waste of time. If you turn on too much water, the rush washes out great holes in the ground, and often washes out the seeds and young plants. The amount of water to be turned into one of your plots or basins can only be learned by experience. It depends on the soil, slope, etc. As for the basins, it is generally better to have them of a moderate size. I have heard of a basin in Mexico 1000 acres in extent, and of others about 20 feet square. In California they range from about 200 acres to less than half an acre. With very extensive basins such a large flow of water is required that it becomes difficult to manage ; while in small basins there should not be much waste of water. Some successful irrigators use basins about half an acre in extent ; but much depends upon the shape of the land to be irrigated.

"It pays an irrigator to devote some time and attention to the openings for diverting water into the basin or plots. Most of the irrigators that I know simply dig out a place in the bank and shovel the stuff into the furrow to form a dam. Then they dig out the dam and throw the stuff back to fill up the opening. Every time this is done there is a certatn amount of earth washed away, and I have often seen great holes in the ground three to four feet deep from which material had been taken for damming the water. This sort of work is bad, and there is no need for it. It is infinitely better to build permanent sluice-gates along the furrow, and others at the lowest ends of the basins to let out the surplus water. These gates should be well bedded, and the frames should run well into the banks on both sides. If this is not done you will have trouble from the water working its way round or under, and some day when you are not expecting it, a sluice may easily be washed out. In extensive irrigation works it is absolutely necessary to build permanent sluice-gates across the large canals for diverting and dividing the water ; but with small canals this is not necessary.

After you have irrigated and sown you will probably see a crop come up bearing a look of promise; but suddenly it begins to look sickly, and as days go on the growth is patchy, being fair in some places, scanty, weak, or absolutely at a standstill in others. Most beginners think the remedy is to pour on more water as soon as the top of the ground looks dry, and the more they pour it on the less things may improve. Perhaps they have put on too much water, packed the ground too closely, and shut out the air that the roots require. It is not easy to say why standing water injures, more or less, so many plants by simply touching the stalks; but it is a fact.

The following points should be borne in mind, but they are only general and subject to many exceptions depending upon soil, climate and crop :—

(1) Nearly all plants are more or less injured by flooding when they are very young.

(2) A layer of fine mud may prevent many seedlings from coming to the surface.

(3) The deeper the water and the longer it stands the worse it is, especially with muddy water.

(4) The hotter the sun after the water is off the worse it is.

(5) High winds after flooding may cause more trouble than still weather.

(6) Most plants stand flooding better as they grow older, and many never do as well with flooding as with the furrow system, in which the water never touches the stem of the plant. This is the case with most trees and with many garden vegetables.

(7) Some plants, such as well-established lucerne on loose open soil, seem to do as well under flooding as under the same amount of rainfall.

(8) The injury from flooding is much less in damp, cool weather than in dry hot weather.

"The real remedy for the troubles that may arise under the system of flooding is to have the ground so wet, and so thoroughly cultivated, that the seed will come up and *grow*

for a long time without needing more water. It is difficult to induce some people to believe that ground thoroughly wet, and having the surface cultivated so as to cover it with a thick tilth, will carry a crop for several weeks without another irrigation; but it is nevertheless a fact, and in parts of America, where grain cannot be raised at all without irrigation, immense crops are carried by this means almost to the point of heading.

The injury caused by flooding appears to vary to some extent with the soil and climate, and you may find the results to be good in spite of the crops looking a little sickly at the start. I am not advocating flooding—I am simply trying to describe one of the recognised systems of irrigation; but a farmer who has to irrigate by flooding (and in many cases it is very convenient) had better find out as soon as possible its effect on the crops he intends to cultivate. If the soil is not too hard and tight, and water is not applied too frequently or too liberally, you may find flooding very profitable and convenient; but it is not always the best and is often the worst way to irrigate. You must be guided by circumstances and experience.

The basin system described is only applicable to land that is level or almost level; but where the slope of the ground is great enough for the water to move freely after the crop is up, a modified system of fairly long narrow strips of land enclosed by banks down the sides may be used with advantage. These strips must be level from side to side, so that the water will spread over the whole surface and flow down in fairly even stream. If there is any side-slope the water will soon find it out and will flow down that side of the strip, leaving the upper part dry. These strips are sometimes made quite long, and vary in width from ten feet to twenty-five feet; but I think that as a rule they should only be moderately long, and a farmer should hesitate before he makes them over 300 feet long or over 25 feet wide. If they are made too long the upper ends get too much water.

To enable the water to run properly the slope or fall should be about one foot in 100 feet; but if there is a thick crop a greater fall can be used. In any case the water must not run fast enough to cut up the ground when first planted,

The strips must be carefully graded, and unless the ground has a long and easy slope requiring very little grading, and steep enough to ensure the required velocity for the water, they may be more expensive and less efficient than basins. In order not to waste water, the surplus at the end of the strip should be collected in a furrow and used on another piec of ground.

These two systems of irrigation by flooding differ in two important points—in true basin irrigation the ground is almost level, and small basins, if filled quickly, are practically covered with standing water, while with the long strips a sheet of water is run over the surface, and there is no standing water. In deciding whether to use flood irrigation or not, the following points should be considered :—

(1) If the slope is suitable, flooding is the cheapest method for handling large heads of water on large areas.

(2) Where the soil is very porous, flooding is often the only way to ensure quick and uniform wetting.

(3) Where the sub-soil drainage is bad and the ground is liable to become waterlogged, great care must be exercised in applying the water.

(4) Where the slope is too flat for the water to run in small streams, flooding is often the only method for for doing quick work.

(5) The rate at which your water is delivered (on a large irrigation canal this may be very important).

"The merits of irrigation by flooding may be stated very shortly :—*It is often the most convenient and most suitable method though not the best for results.*

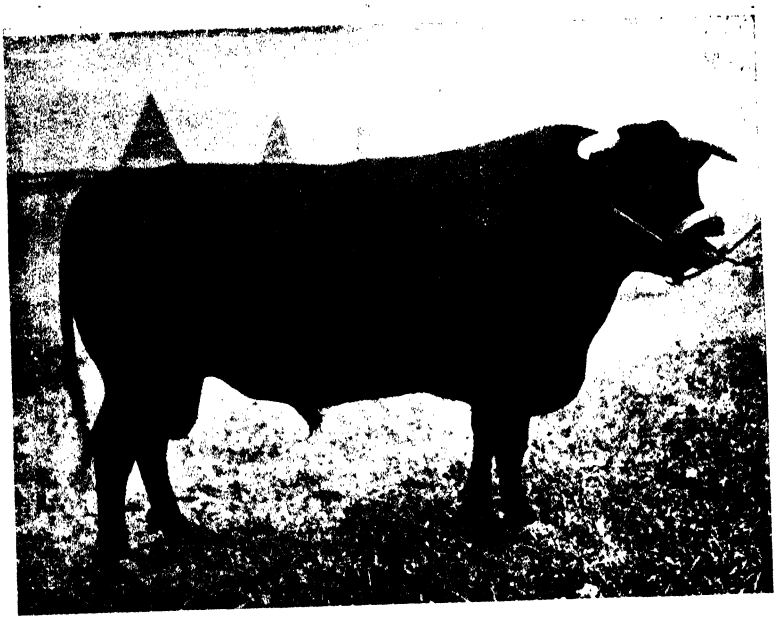
The Sussex Breed of Cattle.

By L. E. W. BEVAN, M.R.C.V.S.

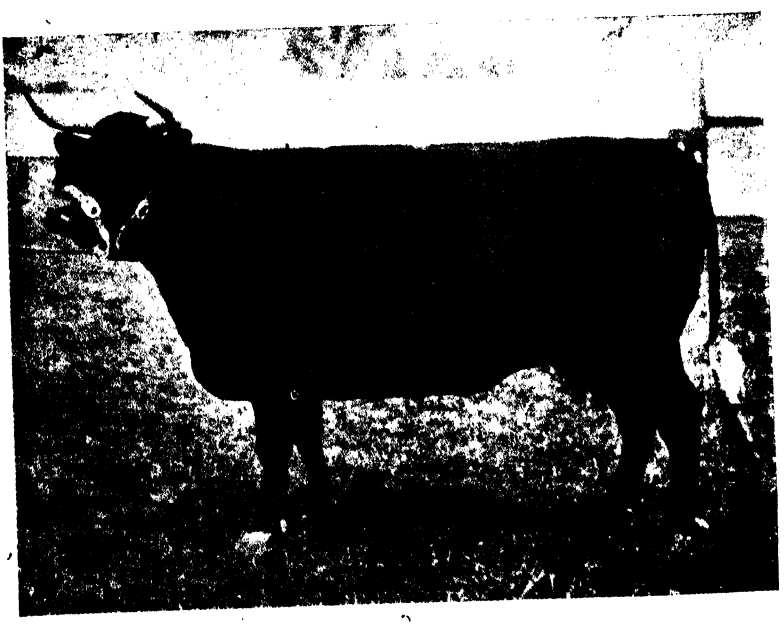
It has been considered advisable to delay the publication of a note concerning the merits of the Sussex cattle in this Journal until a trial has been carried out to test the suitability of the breed to Rhodesian conditions, because it has so often happened that, when the arrival of imported stock has been announced in these pages, the animals have succumbed to one or other of the many diseases to which un-acclimatised cattle are liable in this country, almost before the article has been printed.

Indeed, so heavy has been the mortality among highly-bred stock from overseas, that the individual desirous of improving his herd, has been forced to the conclusion that he must content himself with obtaining partly acclimatised animals from the Southern colonies, or discover some class of animal of such exceptional vigour and constitution that its chance of survival render the investment less hazardous.

Now, although many good-class animals have been obtained for this country, it is pretty generally recognised that if we are to take a place in the meat markets of the world we must aim higher, and in spite of the risks, we must constantly and steadily improve by introducing, not only good blood but blood of the very best. When we consider that Argentine breeders do not hesitate to pay over £3,000 for an animal to suit them, we realise the immensity of the task before us. We commence with a valuable nucleus in the native cattle of the country and of the territories to our north, since these animals, though small, are well fleshed and "kill" exceptionally well, are hardy, acclimatised and resistant to local diseases, throw readily to bulls of other breeds and suffer from little or no trouble in parturition. Professor Wallace emphasised the value of this asset and suggested that by introducing Africander blood we might obtain a larger animal, more profitable for beef and trek purposes:—the Africander being selected on the grounds that while it possessed the virtue of size, acclimitisation, hardiness, and



Sussex Bull "Lord Comp" (1778), *Champion, B. and M. Show, 1904, and Champion at Park Royal and Sussex County Shows in 1902 and 1903. Owned by the Hon. R. P. Nevalle, Birling Manor, West Malling. Grandsire of Mr. Bevan's Sussex Bull, "Rosebush."*



Sussex Cow, "Faucy," *First, B. and W. and Royal Counties Shows, 1905, etc., etc. Owned by Earl of Derby.*

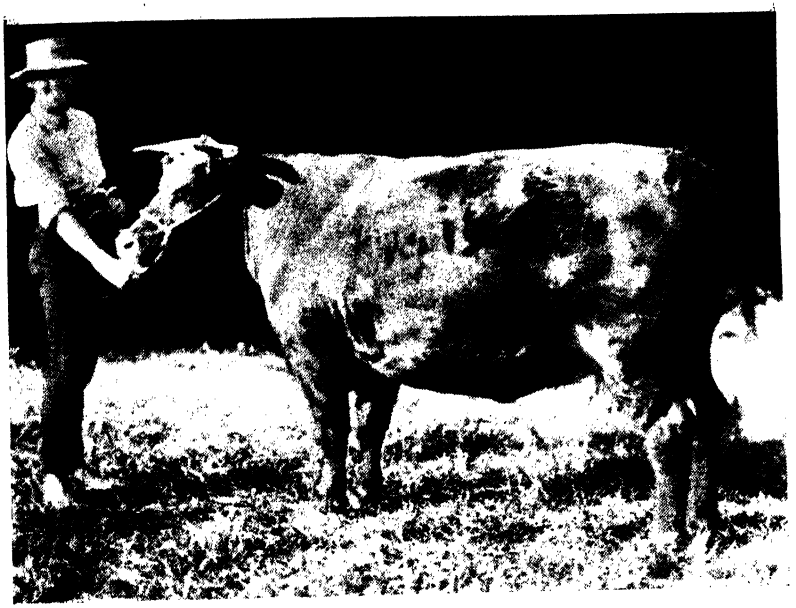


Photo by] [F. Coop.

Imported Sussex Cow (59P). *Property of the Transvaal Government. Bred by Hon. R. Neville, Maidstone.*

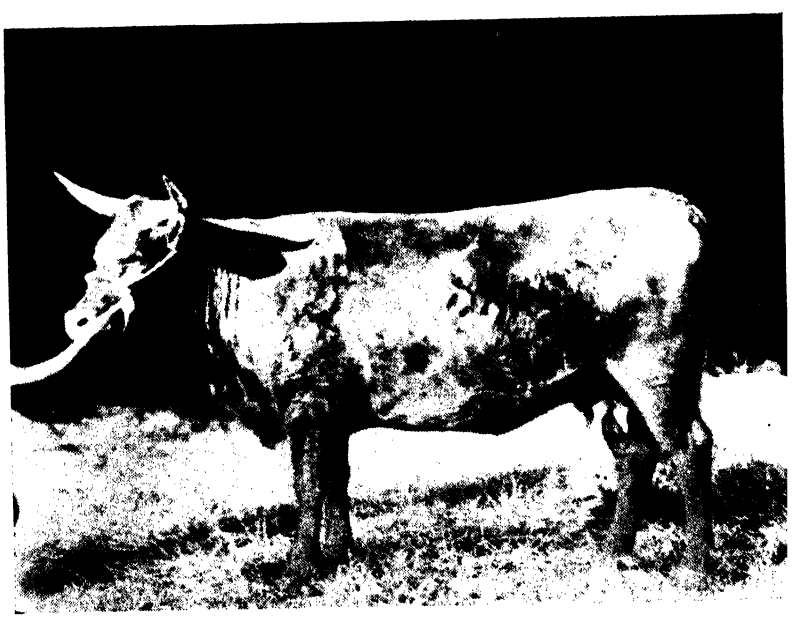


Photo by] [F. Coop

Two year old Sussex Heifer (D.O.A. 42P). *The property of the Transvaal Government, bred at the Government Stud and Experimental Farm, Potchefstroom.*

excelled as a draught animal, it did not reduce the inherent qualities of the local stock.

But it must be admitted that the Africander is slow to mature and that its meat is not well spread; further, several of the largest breeders in Matabeleland, after many years experience, pronounce the mating of native cows with Africander bulls a failure in that the subsequent breeding qualities of such cross progeny is lamentably deficient and subject to reversion.

On these grounds it is obviously desirable to establish a type of animal possessing in a certain degree the hardihood and rustling characters of the native and Africander, while at the same time introducing the quick maturing and other desirable qualities of some established breed. It was with this object in view that the writer introduced the Sussex, an animal which, while possessing the good qualities of the various improved breeds, has the additional qualifications of being a rival to the Africander as a trek animal. For centuries the Sussex ox has been used for draught purposes in the South of England, and even to-day, many spans may be seen at work in the wagon or plough in the counties of Kent and Sussex.

There is no breed which can boast of greater antiquity than the Sussex. Wallace states that it belongs to the old race which gave origin more or less directly to the West Highland, various Welsh breeds, Hereford and the Devon. The purity of the breed has been maintained through the centuries with the result that no bull is more prepotent or capable of impressing its qualities upon its progeny with greater certainty. The off-spring of Sussex bulls, no matter what breed the cow, nearly always comes true to his colour and type. At the same time close in-and-in breeding with its attendant dangers of loss of constitutional vigour, loss of size, fertility, etc., has been avoided.

As with all other imported stock the hardihood of the Sussex and its capacity for "rustling" under Rhodesian conditions remained to be proved, but in view of the fact that its native home at the South-Eastern corner of England is one of the most exposed parts of the British Isles, subject to extremes of heat and cold, drought and moisture, there was reason to hope that as far as hardihood was concerned, it should

prove "seond to none." Moreover the Sussex breed has been brought up on its native pastures without artifical feeding, with the result that to-day, no breed is able to thrive on less, or able to respond better to good things when it can get them. As has been pointed out, the chief drawbacks of the Africander are its slowness in coming to maturity (a feature which affects the breeder's pocket more severely than is apparent at first sight) and the fact that for killing purposes its meat is not too well spread over the carcase. In these two respects the Sussex ox excels, no animal matures more quickly, and none kills better. The following figures, taken from the returns of the last Smithfield Fat-stock Show bears out these contentions.

CARCASE CLASS FOR STEERS

Above 2 and not exceeding 3 years old.

Breed.	Arrival weight lbs.	Percentage carcase to live weight.	Daily gain. lbs. ozs.
Sussex ...	1776	69.08	1 10.33
Sussex ...	1656	68.47	1 9.35

LIVE WEIGHTS.

Average Daily Gains.

CLASS.	Average Daily Gain of Prize-winners.				
	1st lb. oz.	2nd lb. oz.	3rd lb. oz.	4th lb. oz.	R.N. lb. oz.
Sussex Steers not exceeding 2 years ...	2 3.04	2 0.72	2 1.95	2 6.58	2 5.26
Sussex Steers above 2 and not exceeding 3 years	1 14.6	2 0.7	2 1.67	...	1 14.02
Sussex Heifers not exceeding 3 years ...	1 10.32	1 0.79	...	...	1 10.63

The beef of the Sussex is of excellent quality and it often happens that animals which have been worked up to the age of seven or eight, are then put by and fattened and produce meat of high quality.

The Sussex are of a deep red colour, sometimes so dark as to be "plum" coloured or nearly black. Some grey hairs are permissable and often a white splash is seen along the belly. The tail ends in a fine white brush. The hair is fine and not too thick, while the skin is thick, and more than one Dutchman who has seen the bulls in Rhodesia, has exclaimed "hij zal goede reims maak." The Sussex is larger and stronger than the Devon which in many respects it resembles; it is also less compact. Its horns are long and strong and almost approach the "longhorn" type.

The bullocks are remarkable for their strength and endurance and are fine movers.

The cows have not been developed as milkers, but would probably "hold their own" with the average milch cow of this country. They give sufficient milk to rear their calves well and may be classed with Aberdeen-Angus, Herefords, Devons or Cruikshank-Shorthorns, in this respect. Freshly-calved cows give, on an average, about three gallons a day of a good rich milk. Breeders at home would be well advised to develop, by selection, a milk type.

Unfortunately the breed is not well known, the reason being that it has never been advertised but has been in the hands of a limited number of somewhat conservative landowners who have had no desire or necessity to "push" the breed beyond the limits of its native country. This state of affairs is now at an end and the present Committee of the Sussex herd book Society recognise the desirability of making the breed better known in the Colonies and stock-raising countries.

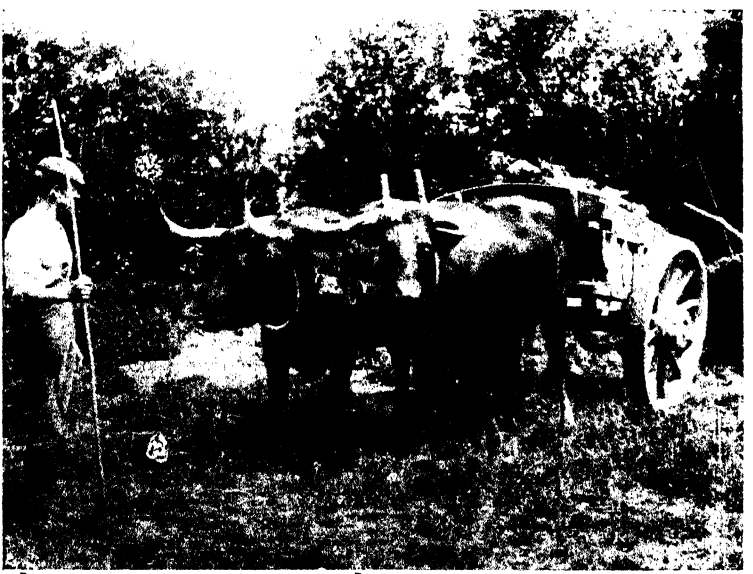
To this end, in 1908, it was decided to purchase annually, one or two approved bulls for export, and the first consignment was presented to the writer who brouht the two selected bulls "Rosebush" and "Limehurst Alick," together with the bull "Egerton Samson" purchased for Mr. Clayton, to Rhodesia in June last. It may be claimed that

up to the present the experiment has proved an unqualified success. The three animals after arrival and after application of the usual tubeculin test, were removed to the farm Ballineety on the Gwebi River, 24 miles from Salisbury. It may be mentioned, in passing, that several Veterinary Surgeons of experience in Kent, informed the writer that they had never known a Sussex animal react to tuberculin, and although this statement may be open to criticism, it would indicate, at any rate, that the breed has some inherent qualities which render it resistant to disease. This was particularly noticeable in the result attending the inoculation of the imported bulls against "red-water" and the allied diseases of the district. All three animals were treated in no half-hearted manner; that is to say, it was determined that if they were to succumb, it was better that they should do so before any great time and trouble had been expended upon them. Consequently, the system of inoculations adopted was of a most rigorous character. Each of the animals reacted and in turn suffered more or less severely, but the extraordinary vitality and constitution of each of them was clearly manifested at one time or another. Recovery from each inoculation was followed by the introduction of a virus of greater strength than the preceding until at last no reaction followed and the animals were considered "salted."

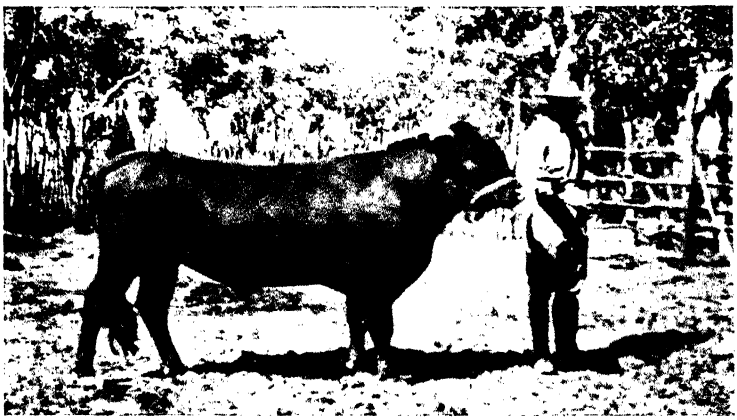
From the day the inoculation process ceased they have been running on Rhodesian veld, receiving, until the end of the year, exactly the same treatment as the native cattle with which they were grazing. About January last, with the onset of the rains and the increase of ticks, mild relapses of "red-water" occurred, but, except for a slight "falling-off," these caused but little disturbance. At this time, also, the new grasses being very laxative and containing little feeding value in proportion to bulk, it was thought wise to give the youngest bull, "Limehurst Alick," and Mr. Clayton's bull, "Egerton Samson," some harder food in addition. The oldest bull, "Rosebush," however, did not receive this assistance and, indeed, except for a little linseed gruel given during the crisis of "red-water," has received nothing but the natural grasses since the day of his arrival in the country. Such treatment, no doubt, will be condemned as unnecessarily severe, but the animal was here to test the capa-



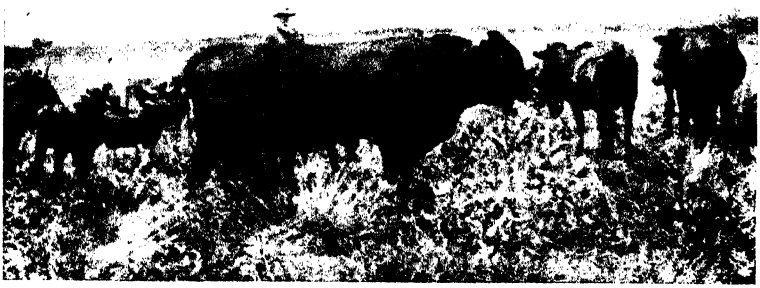
Sussex Cows, the property of Mr. A. Finn, Westbroke, Kent, England.



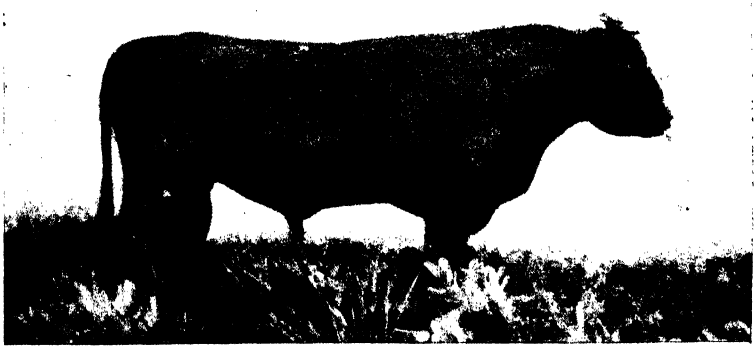
Sussex Oxen at work.



Sussex Bull "Rosebush," No. 2450. *Property of Mr. LI. E. W. Bevan, Ballimoty, Rhodesia. Photograph taken shortly after arrival in Rhodesia; age, 16 months.*



Sussex Bull "Rosebush," No. 2450. *Photograph taken at the age of 2 years.*



Sussex Bull "Egerton Samson," No. 2457. *Age 1 year 5 months. Property of Mr. F. Clayton, Salisbury.*

bilities of the breed and was placed under conditions which would constitute an exceptionally thorough test. The photographs, which those who saw him at the time of his arrival and at the time when the second picture was taken, consider truthful representations of his appearance, will show how satisfactorily he has come through the ordeal. In addition he has been regularly at service, and, during the past ten months, twenty-eight cows have come in calf to him. Mr. Clayton's bull has been equally successful as a stock-getter, but being younger and not here for experimental purposes, he has been rather more generously treated. "Limehurst Alick," who at the time of arrival was less than eight months old, has been treated a little more carefully than the big bull, but has not been pampered. He was intended as a "second string," the idea bing that the older bull would travel better and would serve earlier, while the younger animal would be less likely to die during acclimatisation and inoculation. It is claimed, therefore, that the results of this test have more than justified the hopes and anticipations of those who knew the breed, and have shewn the Sussex to be one of the most suitable animals for the purposes of this country.

The progeny of "Rosebush" from the local cows of various types have not yet put in an appearance, but it is hoped that when they do a separate account of them may be issued.

Discussing the Sussex breed of cattle, that recognised authority on cattle, Mr. Alexander Holm, the General Manager of the Government Experimental Farm, Potchefstroom, writes: "Our first importation took place in 1903. In our experience the Sussex cattle are both thrifty and hardy. In these respects they may be placed in the same category as Herefords and Aberdeen Angus, and appear to excel Shorthorns on inferior pastures and where winter fodder is not abundant. Our Sussex cows have bred with great regularity and there have been fewer losses among their calves than among those of the other "improved" breeds maintained on this farm. I am of opinion that this points to great vitality and strong constitutions in th parent stock, which have not been vitiated by generations of in-breeding to a greater or less degree, and by natural conditions of management of the herds comprising this breed. In regard to the value of

Sussex sires for grading up the common cattle of this country, I may add that I have seen several calves by Sussex bulls out of the ordinary Africander cows of this colony (Transvaal). The Sussex character and type is strongly marked in these calves, and with few exceptions are uniformly of a deark red colour. Such calves are as a rule short in the legs and strongly built. Sussex cattle which are short in the leg, wide, long and deep in the body, are to be found, and this is the type which I would recommend."

A number of different breeds including Coates Shorthorn, Lincoln Reds, Sussex, Herefords, Aberdeen Angus, Jersey and Friesland have been imported by the Transvaal Government and placed upon its Stud and Experimental Farms, and the Sussex have shewn themselves not only to be a useful and desirable type, individually and for grading up the native stock, but have also proved eminently adaptible to their new conditions of life and have taken readily and kindly to the veld.

One other feature about the Sussex is that, at the present time, an animal of the highest quality can be bought at a comparatively low price as compared with the best blood of other breeds. This is a state of affairs which will not last however, as the result of the more up-to-date methods of the Sussex Herd Book Society and of some of the fanciers of the breed, the Sussex is becoming more widely known and already is taking the place of some of the breeds which have hitherto held the field undisputed.

Notes on Trypanosomes of the Dimorphon Group.

By L. E. W. Bevan, M.R.C.V.S. and Malcolm E. MacGregor, of Emanuel College, Cambridge.

In view of the recent attention that has been given to the trypanosomes of the dimorphon type, it may appear unnecessary to recapitulate the circumstances which have given rise to so much discussion.

It will be remembered that in 1902, Dutton and Todd encountered in the blood of horses in Senegambia a trypanosome having three forms, namely :—

1. A long slender form with free flagellum ;
2. a so-called "stumpy" form ;
3. a short "tadpole" form.

Recently in working with the strain of parasite brought back from Africa by Dutton and Todd, various observers, viz., Thomas, Breinl, Laveran and Mesnil, have failed to see the long forms with thin body and free flagellum originally described, and it is suggested that Dutton and Todd were dealing with a mixed infection, one of which has died out. Mesnil has expressed his opinion that the original trypanosoma dimorphon described by Dutton and Todd included trypanosoma dimorphon (*sensu* Laveran and Mesnil), trypanosoma cazalboui (Laveran) and trypanosoma pecaudi (Laveran), since these species can occur at one and the same time.

Montgomery and Kinghorn have explained that the trypanosome, which Dutton and Todd described, did not come from the animal, which was the source of all the European strains of trypanosoma dimorphon. The latter statement arose from the fact that Montgomery and Kinghorn had encountered in Broken Hill, North Western Rhodesia, the same types of trypanosomes as those first seen by the original observers in Senegambia.

The following observations have a bearing on the question :—

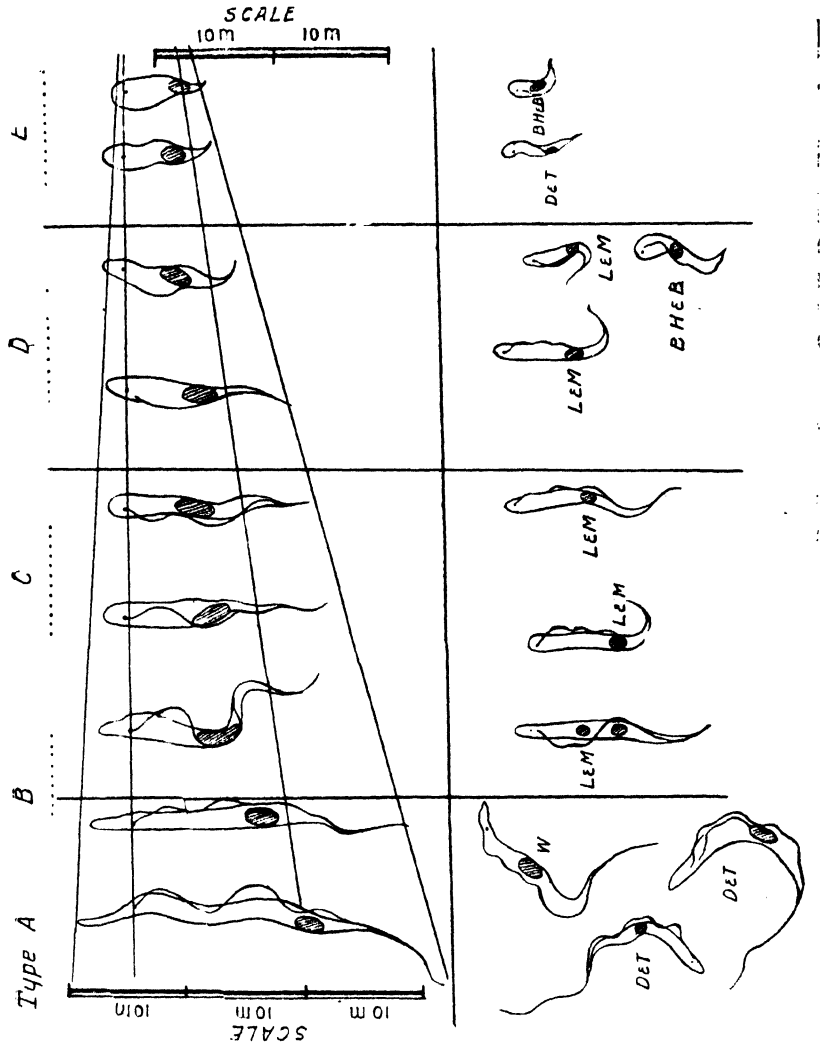
Blood was obtained by Dr. MacKnight from a cow dying of typical trypanosomiasis at Broken Hill, and inoculated subcutaneously in doses of 40 minims into six local fat-tail sheep, which were sent by rail to Salisbury, in order that a strain might be established for comparison with the trypanosomiasis of live stock of Southern Rhodesia.

The sheep were inoculated on February 13th, and were received at Salisbury six days later. For the purposes of this note it is unnecessary to give full details of the temperature and trypanosome records of these sheep, but the following table is of interest :—

Sheep No.	1	2	3	4	5	6
Period of incubation in days	14	15	15	15	17	17
Duration of disease in days	52	35	80	34	80	34

No long form of trypanosomes with undoubted free flagellum was ever encountered in any of these sheep during the whole course of the disease, but the examination of a great number of blood preparations has enabled us to classify the forms met with under the types c. d. e., a system of classification which will be explained later in the course of this note.

From sheep No. 2, one c.c. of warm blood was taken on March 12th, and was injected subcutaneously into a white rat. On the third day after (somewhat to our surprise, seeing that Montgomery and Kinghorn state the period of incubation in these animals to be 6 to 10 days), we found the blood of our rat to contain a considerable number of trypanosomes. On an average in each field examined under a 1/12th oil imersion by 3 eye pieces, one trypanosome was encountered. Still more surprised were we to find that the parasites met with were of the long free-flagellated variety, and were present in apparently pure culture, since Montgomery and Kinghorn found in their inoculated rats that "tadpole" forms predominated throughout the first few days of the disease. Indeed from the morphology and short period of incubation, we at first regarded these as T. Brucei, a diagnosis which subsequently was proved to be incorrect. During the next



No. 1. Drawings of trypanosomes seen in rat inoculated with the animal trypanosome of N.W. Rhodesia.

No. 2. Tracings of illustrations of T. dimorphon after various authorities.

D. & T. Dutton and Todd.
L. & M.—Laveran and Mesnil.
W.—Welcome Laboratories Report.
B., H. & B. Bruce, Hamerton and Bateman.

few days careful examination of this animal's blood was frequently made, and day by day the long forms with free flagellum became less numerous, while other forms of all gradations, from the long form to the "tadpole" type, made their appearance. The drawings from actual specimens made to scale but admittedly diagrammatic, show the various types met with, and explain the impression forced upon us that the long type, for reasons unknown, became differentiated or replaced by other shorter types in descending scale until the shortest or "tadpole" form was evolved.

In the long form the portion of the protoplasm posterior to the micronucleus was elongated and tapering (effillée), sometimes as long as 5 m., but in the descending forms it became shortened and rounded relatively to the decreasing total length of the parasite, until the rounded end of the "tadpole" type was reached. In the same manner and in direct proportion to the above changes, the free-flagellum shortened and finally disappeared. Similarly the festooning of the undulating membrane, most elaborate in the longer forms, became gradually less, until, in the "tadpole" types, it was almost inappreciable. But the distance between the nucleus and the micro-nucleus did not appear to decrease in direct ratio to the reduction in the total length of the parasite, so that in the "tadpole" forms the nucleus was relatively nearer the anterior end than the longer forms.

On this basis we have established a system of classification of the various types under the headings a. b. c. d. e., according to their resemblance to the forms pictured in the drawing. For obvious reasons we prefer this system to the use of the terms "long," "stumpy," and "tadpole." As far as this trypanosome of North-Western Rhodesia is concerned, we agree with Montgomery's deduction that, "we "have here, then, a trypanosome whose prevailing type in "naturally and experimentally infected animals is short, "measuring only 9·75 to 15·3 m., and from which there is a "relative absence of a flagellum. This type under the "influence of a different host, or under natural conditions in "the same animal, assumes a distinct form which measures "from 25 to 31 m. in length, and possesses a flagellum which "may be upwards of 10 m. long."

The Conservation of Kraal Manure.

By H. GODFREY MUNDY, Agriculturist and Botanist.

Southern Rhodesia is a young agricultural country in the sense that for the greater part the arable lands have only been cropped for a comparatively short time. There is however much land that could, by manuring, be increased in fertility; and already complaints are heard regarding the high price of artificial fertilisers, while the need for some systematic method of manuring becomes each season more apparent. It is perfectly true that distance from the sources of supply and the high cost of railage place the use of artificial fertilisers beyond the reach of many farmers, but it is also a fact that every farm is its own manure factory, and it rests with the individual farmer at a little extra expense to double if not treble his manure supply. Well preserved farm yard or kraal manure is absolutely essential on a properly managed mixed farm, and artificial fertilizers, let them be ever so cheap, can never entirely replace it. It is estimated at the present time that on the better classes of soil and without manure, the average crop of maize is six bags per acre. On richer soil ten bags per acre is often reaped over a comparatively large area, while on alluvial ground and in many of the fertile valleys crops of from fifteen to twenty bags or more an acre are frequently obtained. There is no reason why with the use of manure, good cultivation and seed selection a uniform crop of from ten to fifteen bags per acre should not be obtained. It has been done in other countries and can be done here.

Much of the maize land of this territory is of a light character, while in other parts the complaint is often raised that the soil packs so hard that winter ploughing of old lands and the proper preparation of a seed bed beomes well nigh impossible without excessive labour or the use of costly machinery. Broadly speaking, there are two methods by which these conditions can be ameliorated: (a) by the application of lime, (b) by supplying decaying vegetable or

organic matter to the soil. The first can usually only be achieved at considerable expense on account of the high cost of transport from the lime pits to the farm. The second to a greater or less degree is in the power of every farmer, since farm yard manure, besides being an active fertiliser, is of even greater value owing to the important physical effects which the humus it contains produces in the soil—making it more retentive of moisture and more easily worked.

The productive capacity of a Rhodesian farm depends, apart from the acerage of arable land, upon the number of draft animals available for the various operations of ploughing, cultivating, etc. In addition to its othhr uses each of these animals should be considered a factor in maintaining the fertility of the soil, and just as the dairy cow is looked upon as a machine for supplying milk, so may the ordinary farm stock be considered, in addition to their other functions, machines for supplying manure.

Mixed farmyard manure is not only valuable on account of the organic matter which it contains, but also owing to the three principal plant food ingredients: nitrogen, phosphates and potash, and is thus in the nature of a complete fertiliser. The urine of animals is far richer in fertilising ingredients than the solid excreta, particularly so in nitrogen and potash. For this reason it is of the utmost importance to preserve the urine by absorbing it in the solid matter and litter. Primrose McConnell quotes experiments in Great Britain in which Ayreshire cows produced 60lbs. of solid and 18lbs of liquid matter per diem, while Heiden found that of thirty cattle under observation the average daily amount of manure voided was 88lbs of solid and 21lbs of liquid. An ox may therefore be said to void about 100lbs of excreta per diem, but in this country where it is usual to kraal the cattle during the night only, it is more difficult to arrive at a correct approximation. The length of time the cattle spend in the kraal and the question of the feeding they receive will make a considerable difference in the estimate. On the Government Experiment Station, Salisbury, in a short series of experiments, the amount of solid excreta voided by each beast per night averaged approximately 13lbs. The animals were placed in the kraal at about 6.30 p.m., and were turned

out again about the same time next morning—no roughage being fed to them during the night. These investigations are not yet conclusive, but calculated on this basis a beast will produce in a year about 5,000 lbs. of solid and liquid excrement, and if allowed hay during the night probably considerably more. In these trials no litter whatever was allowed for, while in Great Britain from 16 to 24 lbs. of litter per head daily is often thrown into covered yards and considerably more into open yards.

The importance of adequately littering the kraal cannot be overestimated since it adds to the comfort of the animals, and by absorbing the liquid matter prevents waste of the most valuable ingredients and greatly increases the supply of manure. A further consideration is that, where open kraals are situated on a slope, as is generally the case, a large proportion of the plant food is leached out of the manure by the washing of heavy summer rains. By littering the kraal this wastage can ta a great extent be checked, the manure will pack down more firmly, will remain cooler and moister, and can be handled with far less waste than the dry material which one now frequently sees carted from the kraals and applied to the lands in so dusty a condition that much of it is blown away by the first heavy wind.

It is to be presumed that the making of the kraal on a slope is to allow of drainage, and this is precisely what should be avoided if good manure is to be produced, and which can be avoided without any injurious effects to the animals if a certain amount of bedding is thrown in once or twice a week—more during the rainy season, and less in the dry months. Again, the kraal situated on a slope is subjected to washing by the water which, during the rains, comes down from the hillside above. This, needless to point out, is equally undesirable and can be prevented by digging a cut water drain around the upper side of the kraal.

The more level the site of the kraal the better, while the centre may with advantage be excavated slightly and puddled so as to form a saucer-shaped area more or less impervious to seepage. In this way the liquid manure will to a great extent be absorbed by the litter.

Before dismissing the subject it may be well to add a few remarks regarding the method of applying kraal manure. As can be seen from an analysis of farm yard manure the main ingredient is nitrogen in one or other of its forms, and as is well known nitrogenous manures promote luxuriant vegetative growth rather than the formation of seed. For this reason, where grain crops such as maize are grown, it is better policy to apply moderately light dressings fairly frequently rather than excessively heavy dressings at longer intervals, and by so doing the fertility of the soil can be more evenly maintained. From eight to ten tons of dung per acre may be considered a generous manuring, and in practice in Rhodisia from six to eight tons per acre will probably be found to give good results on land which is not too exhausted.

There is grass in abundance, and for bedding purposes this can be cut at any slack time during the summer months at very little expense. Presuming that a farm animal when kraaled at night only voids upwards of three tons of dung per annum, by the use of litter in the kraal and by taking precautions to avoid wastage this amount can at least be doubled. On the average Rhodesian farm, by the time the land is requiring manure, there will usually be at least twenty head of mixed cattle per 100 acres under crop, and at the figures taken these will produce over a hundred tons of dung per annum, thus permitting a fair proportion of the land being manured each year.

It is not suggested that this supply will be in all cases wholly adequate, but at least it will be more than is often available under present conditions of kraaling, and the time is coming when it will be realised that there are better profits in manuring and thoroughly working a small acreage, thereby ensuring a heavier crop per acre, rather than by undertaking more than can be properly worked and so reducing the yield while maintaining the increased expenditure on machinery and labour.

Rubber and Coffee in Rhodesia.

SOME PRACTICAL HINTS REGARDING THEIR CULTIVATION.

By C. F. M. SWYNNERTON, F.L.S.

Should all the seedlings at present in nursery be planted out, the acreage under coffee in the Melsetter District will have been trebbled by an early date next season. Several men, too, are turning their attention to Ceara rubber, and, should the long-expected and oft-despaired-of railway ever become a certainty, there is a considerable area of ground in Southern Melsetter that will probably at once be devoted to these two products.

The following notes may, therefore, not be out of place.

The "orthodox" instruction that is meted out to the incipient coffee planter by writers on the subject is usually much like this: Clear your ground, burning the jungle, or "better" (Nicholls' *Trop, Agriculture*, p. 98), packing it between the rows, then dig holes from one to two feet square and deep, and from six to nine feet, according to the character of soil, slope, etc., apart each way. Fill these up with surface soil, weeds and manure; "the more weeds buried the better." Weed constantly by hand and bury the weeds in holes. When manure becomes necessary bury this, too, in holes.

On first commencing to plant I followed the above recommendations most religiously, but I have since dropped them one by one. The well-known advice, "don't bother so much about its depth, but take care that your hole is as wide as the piece of ground you intend to plant," is sound and applies as much to coffee and Ceara rubber as it does to eucalypts and fruit trees. The ground should be thoroughly cleared and stumped, and the bush removed or burnt. A patch of Ceara in which I had failed to remove certain stumps was attacked by a root fungus (probably *Fomes* sp.), and I lost several trees, and was put to much expense in trenching before I could eradicate it. The soil should then be deeply ploughed and harrowed and, generally, prepared as for a

crop of mealies. If it is at all poor, manure should be added, at all events in the neighbourhood of the stations where it is intended to plant the trees. With regard to holes, all that is necessary is to scoop out enough earth at the time of planting to enable the roots to be properly spread. As for the weeds that it is usually recommended should be placed at the bottom of the hole, well, they are useless in ihat position to the feeding roots, and the tap root can do without them. In fact, the sooner the latter can strike solid soil the sooner is the tree anchored and secured against being "wrung" by the winds. I have had excellent instances of this in eucalypts, coffee and Ceara rubber, trees that were planted in holes having to be righted and staked after every slight gale, while others planted without holes in ploughed soil were very little affected. Again, in certain soils holes are very liable to become water logged during our heavy rains of January to March. In any case, whatever the reasons, eucalypts, coffee and rubber trees planted here in ploughed ground show a far better and healthier growth than trees of the same species planted alongside in 2 ft. 6 ins. holes.

Eight feet by eight is a distance that has been largely adopted for coffee in this district. The trees are hand-weeded and are usually manured, as stated above. I found this unsatisfactory from the outset, and have spaced all my subsequent plantings 12 by 8 and 12 by 7. The 12 ft. space between the rows enables the plantation to be ploughed in that one direction for a good many years before the trees close up, and not only saves much hand-weeding but enables one to utilise the weeds themselves for manure in the cheapest and most efficient way. They are allowed periodically to attain a certain height and are then ploughed under with whatever one may have placed on the land in the shape of special green-soiled crops or of actual manure. Everything that I have said here applies equally to Ceara rubber, excepting that the final spacing in this case should not be less than 18 by 18. The wider the spacing the quicker the trees make fine tappable trunks, but it must also be remembered that Ceara is a very variable yielder, and that it is, therefore, well at the outset to plant four times as many trees to the acre as will eventually remain there, and to thin out after the first conclusive tapping. Meantime the thickly

planted trees will themselves have helped to keep the weeds down. Ceara trees are unusually liable to be broken by wind or, in the young state, "wrung," and coffee, too, prefers moderate shelter. But a good shelter belt has a second and even more important use, which I will illustrate.

I had noticed that a few yards of one of my bitter-apple hedges *(Solanum aculeastrum)* had wilted and finally dropped its leaves, while the branches had previously dried up and were showing abundant evidence of having been attacked by a fungus. Stress of work in other directions, combined with confidence in the unlikelihood of transmissiom from a solanaceous plant to one in *rubiacae* prevented my taking any practical steps with regard to it. But in the thick of the rains and immediately after a particularly favourable spell for the transmission of spores, I noticed the terminal leaves of the leaders and higher primaries of several coffee trees commencing to wilt. An examination showed that in each case one of the internodes, usually the fifth, sixth or seventh from the top of the main stem, had dried up and was exhibiting a slightly mildewed appearance. The leaves and smaller twigs proved on inspection under a lense to be themselves quite unaffected, and were evidently only withering as a result of the check to the circulation of the sap. All the affected trees were, with regard to the previously prevailing winds, in a direct line with the affected patch in the hedge, and they formed a discontinuous band right across the square of coffee. I at once grubbed and burnt the whole hedge and every coffee tree that showed the least sign of having been attacked, and have seen no more of the fungus.

But my main plantings lie beyond and in a direct line with the band of fungus. Why have they not been affected? Simply because the spores were arrested by the dense foliage of a broad belt of cedars, eucalypts and Ceara rubber, on none of which trees do they appear to have been able to thrive.

This principle of disease arresting bands is nowadays being given due recognition in the plantations of the East, and the Government of the Federated Malay States has gone so far as to retain in their own hands enormous barriers of virgin forest between one planting district and another. Should the advent of a railway ever give Southern Melsetter its rightful place as the "planting" district of Rhodesia, the

policy of alternate planting, *e.g.*, strips of coffee alternating with strips of rubber, eucalypts or grass jungle, is one that ought to be adopted by every planter, while the Government might well, wherever that is yet possible, hold back, *e.g.*, as native reserves, an occasional strip of country that would be comparatively useless to the white agriculturist. To take coffee alone, we cannot expect to keep *hemileia vastatrix* out of the district for ever, and a few years hence we may find the disciples of the small-block system, with the men that have the luck to be located under the lee of a "Government strip," congratulating themselves at the expense of their neighbours of "larger" ideas.

But is not all this a little premature? It might seem so; for at this moment the same position continues as existed five years ago, when I wrote an article for this Journal (Rhod. Agr. Jul., 1905, Vol. II., p. 123), to which I would greatly like to refer my present readers. There is no railway, and without it no one is going to be so foolhardy as to plunge into any planting or other operations on a large scale. Northern Melsetter is a glorious sheep district; but the butchers of Umtali look askance at our wethers, for, fine as they are, are they not utterly run down in condition by the time they have completed the long journey to their market? Southern Melsetter, from the Portuguese boarder to the Sabi, is a magnificent planting country. We can raise almost anything, and raise it well. "How then is it," to quote from the article just referred to, "that our farmers with all these unequalled natural advantages are not bringing those thousands of acres under cultivation, are not placing their coffee, tobacco, fruits and timber on the Rhodesian—or South African—markets, or helping to meet the world's demand for rubber and cotton?" The argument that the district has developed no industry to warrant the laying down of a line will not stand, for it is a well-known fact, proved over and over again in recent times, that settlers and their industries follow the railway. One need only instance British East Africa.

I wrote in 1905. But in one or two particulars things *have* changed since then, and my "advice to intending planters" may not be so premature as it would seem. Ceara rubber has proved a definite success in the district and is now known to be a commercial success in other portions of East Africa, in

which it has been planted; several companies have been floated recently and a large amount of capital is being invested in it. Then it has became more generally known that the Sabi valley is a highly mineralised area that only requires a railway to become the centre of considerable mining activity. Lastly, the finances of the country are distinctly sounder now then then: there is a surplus that might well be devoted to projects of this kind, and we feel that we can now quite fairly demand consideration, where formerly we knew that it would be utterly futile.

REPORT ON MELSETTER COFFEE.

Recently a sample of coffee grown by the writer of the above interesting notes was forwarded by the Department of Agriculture to London, and we have just received a report by Messrs. Lewis & Peat, which is published below for general information:—

6, Mincing Lane,
London, E.C.,
19th April, 1910.

British South African Company, Limited,
2, London Wall Buildings.

Gentlemen,

We have received a sample of SOUTHERN RHODESIA COFFEE, for which we thank you. We have examined same, and beg to hand you our report upon quality and valuation of the coffee.

The sample represents a fine, ordinary, brownish, dull and pale coffee, worth about 47s. to 48s. per cwt. in Bond. The coffee has been roughly prepared, many berries are nipped and broken from pressure used in cleaning. Although it is small in size, yet there is an improvement in quality, compared with last year's samples (from North-Eastern Rhodesia).

Unfortunately, prices for almost all medium grades of coffee are rather lower than when we valued for you last year. Many Central American descriptions are now selling cheaply. The coffee "roasts" and "liquores" fairly well, and in quantities would meet a ready sale.

We are, Gentlemen,
Yours faithfully,
(Sig.) LEWIS & PEAT.

Indigestion in Cattle.

By G. C. HOOPER SHARPE, M.R.C.V.S.

Before describing the various forms of indigestion, their causes, symptoms, course and treatment, it is as well to give a brief description of the stomachs of ruminants, especially the ox.

The animals are destinguished from others by the faculty they possess of swallowing their food after imperfect mastication, and causing it to return again into the mouth for a second masitcation before final deglutition.

The gastric apparatus of ruminants is divided into four compartments or stomachs, and these are called :—(*a*) Rumen or paunch ; (*b*) reticulum (honey comb) ; (*c*) omasum (many leaves) ; (*d*) abomasum (the fourth or true stomach). These four stomachs together fill the greater part of the abdominal cavity, and their average capacity is about 55 gallons. The rumen or paunch ; this is by far the largest of the whole mass. It is situated on the left flank and occupies the whole of the left abdominal region from the diaphragm to the pelvic cavity. This compartment is the reservoir of the partially masticated food taken in during feeding time. From thence the food is again carried into the mouth during rumination, or chewing the cud, after being more or less softened by the moisture in the stomach. The reticulum, or second stomach, is situated in the region at the posterior end of the brisket, at right angles to the median plain of the body. It participates in the functions of the paunch, to which itis a kind of diverticulum, more particularly it plays the part of a reservoir for the liquids taken in, the solids in there being always diluted by a large amount of water. After rumination is completed the animal again swallows, and the remasticated food is conveyed by a special channel, the oesophageal grove, into the omasum (many leaves), or third stomach; this compartment is larger than the reticulum in the ox, and is situated above the reticulum and right portion of the rumen. It is made up internally of folds or leaves, between which the food is further ground up into almost a powder. From here the very finely powdered food

is passed into the abomasum. The abomasum, fourth or true stomach, is situated on the right lower third of the abdomen, below the ribs. The anterior surface of the stomach resting on the lower wall of the abdomen towards the middle and right side of the body. It is here the gastric juices are secreted, and the food undergoes its primary digestion before passing into the gut. This stomach in calves is the only one which is active during the first few weeks of the youngsters' life. At this period it is larger than the other gastric compartments.

The four kinds of indigestion I am going to describe are:

1. Gaseous indigestion.
2. Indigestion as a result of overfeeding.
3. Chronic indigestion.
4. Milk indigestion.

1. GASEOUS INDIGESTION (also called Hoven).

Tympanites, or indigestion of the rumen or paunch, is characterised by the rapid accumulation of gases in the large stomach due to fermentation, and it occurs during or immediately after feeding.

Causation.—The chief cause is the introduction of a large amount of food, which ferments and causes the rapid accumulation of gases.

Frequently the giving of large quantities of green fodder, especially if it has been cut some time and allowed to ferment and given to stall fed animals, will cause tympany, and it is generally recognised that this form of indigestion takes place frequently during damp, warm weather, which is a natural aid to fermentation of cut fodder.

It may also be caused by sudden change from dry fodder to green food; by feeding on grass which is rank, and again, the exagerated tendency of young and tender grasses to fermentation when eaten has been known to cause this form of indigestion. Local chills produced by the ingestion of food covered with hoar frost, or even with dew, may favour gaseous indigestion by retarding or suspending the movements of the stomach by direct local action, and interfering with the natural secretion.

Some animals are predisposed to tympanites by the habit of eating too quickly, or by giving them foods which the

animal has not been accustomed to, as brewers' grain, rotten potatoes and turnips, cotton cake, and other foodstuffs.

Certain cultivated plants are liable to produce an attack of gaseous indigestion if taken too immoderately, such as lucerne, green vetches, buck wheat, potato and turnip tops, cabbage leaves, green mealies, new mealies, etc.

Another cause is eating certain toxic plants, like tobacco, poppies, wild tulip, Kaffir corn (young shoots), etc.

Foreign bodies causing obstruction in the gullet may produce tympanites by impeding eructation. Animal which have been sick for some time and not ruminating with consequent admixture of food in the paunch, and its movements being impeded, fermentation proceeds rapidly; as a consequence, the stomach becomes distended and digestion is hindered by arresting the natural movements of the paunch.

Symptoms.—The earlier symptoms of this form of indigestion usually escape observation, and the first and most striking symptom is the sudden increase in the size of the abdomen, especially the left flank; this swelling increases rapidly, so much so that in several cases its highest point may even project above the spinal column; but should the herd boy be observant, he will notice that the animal stops feeding and shows special discomfort, restlessness, repeatedly yawning, and generally wearing an anxious look, before the above great symptom appears, which it does n a very short time, often in less than a quarter of an hour.

This swelling also appears on the right flank, but is more pronounced on the left side. With this symptom the animal shows general disturbance, the nostrils are dilated and respiration becomes rapid. On palpation of the swelling it is found to be tense and very elastic to the touch, and percussion produces a full, clear tympanitic sound. Later panting owing to the pressure of the distended paunch on the lungs. To ease this, the animal is seen to stand with mouth open and four legs wide apart. The eyes become staring, the visible mucous membranes are at first greatly injected, and the veins of the head and throat, and especially the milk veins, appear swollen, sweat breaks out at the flanks, the base of the ears and behind the elbows; the heart beats more rapidly, and finally the pulse is hardly perceptible. Often the animal groans and froths at the mouth, coughs occasion-

ally, and manages by exertion to make a few short eructations. Later the mucous membranes become darker, blue or a leaden colour, and finally, unless treatment is carried out rapidly, the patient begins to stagger, falls, becomes convulsed, and very soon dies.

Post-mortem Appearances.—When the paunch is opened it is often found to contain very little food, but again, it may contain a fair quantity. But the most striking lesion is the enormous quantity of gases. These gases on analysis have been found to be approximately of the following combination: Carbonic acid gas, 74 per cent.; carburetted hydrogen, 24 per cent., and traces of nitrogen. The composition varies a little, according to its origin, but carbonic gas always predominates. The viscera, particularly the intestines, are congested, and with excessive gaseous distension the paunch may become ruptured, but this is of rare occurrence. The larger veins are gorged with dark red blood, which coagulates badly, and on exposure to air perceptibly changes to a lighter red. The lungs show lesions of death from asphyxia.

Pathogeny.—Death is due to poisoning by carbonic acid, partly by inability to inflate the lungs, owing to the pressure on them by the paunch, and partly by diffusion of the carbonic acid from the rumen into the blood.

The Prognosis Varies.—In rapid cases the animal may die in an hour or so, or even less, unless help is not speedily obtained, and even if the gases have been returned, it may continue to ferment for some hours, so requires watching for at least twenty-four hours. But when the tympanitis develops slowly, recovery may be spontaneous, owing to abundant eructations and defaecations.

In general, one may say that this form of indigestion is serious, in proportion to the rapidity with which the gas is generated.

Treatment.—As regard prophylaxis, it is necessary to avoid suddenly changing animals from dry to green food; it is better that transition be effected by giving mixtures of dry fodder and green food. On farms away from town where help might be obtained a cattle probang, trocar and canula should be in readiness; a stitch in time saves nine. There are a great number of methods which may be applied for curative treatment.

Perhaps the most practical method consists in massage of the left flank, by sharply pressing downwards with the open hand, which stimulates the movements of the dormant paunch. This causes the gases to pass onwards into the other stomachs, or assists eruction, thus allowing the gases to pass out by the mouth. The massage treatment may be completed by the administration of stimulants, as alcohol or wines, giving from ½ to 1 pint in double the quantity of water. Perhaps the best internal treatment consists in administering purgatives, such as epsom salts, one to one and a-half pounds, or sulphate of soda, or better, hyposulphate of soda —dose, 4 to 6 ozs.—these check fermentation and so arrest the evolution of gas, and by their purgative properties they stimulate the movements of the stomach, and thus cause eruction. Oil of turpentine—2 to 4-oz. doses—in a bottle of linseed oil, is recommended. But the above methods should not be used exclusively, but as adjuncts to mechanical and surgical means, and all should be preceded by the use of the probang, or puncture of the paunch.

The Use of the Probang.—The ordinary probang is made of spiral wire covered with leather and furnished with a cane stiletto, the whole instrument being about five feet in length, and is usually used in conjunction with a mouth gag, which is a piece of wood with a hole in the centre, to which to pass the probang; but this is not absolutely necessary, should the operator be possessed with a probang alone, the procedure is as follows:— The animal's tongue is grasped by an assistant, preferably with a cloth and drawn well to one side, a cord is then passed round the horns and the head drawn up to the cross beam, and extended as far as possible. Should a cord or cross beam be not available, the horns can be grasped by two assistants, one on each side, and the head held straight out, as above mentioned. Now the probang is placed over the right shoulder of the operator, and then passed over the togue into the pharynx, and thence into the aesophagus.

To avoid injury, it must be introduced cautiously, and it is advisable to dip the bulb end of probang into linseed oil; the only danger is that the instrument may be passed down the wind pipe instead of aesophagus; but this accident is immediately noticed by the animal coughing and choking.

Then, of course, the probang should be at once withdrawn and the attempt repeated.

The entrance of the probang into the stomach is at once evidenced by the cessation of resistance; at this point of operation the stiletto must be withdrawd, and under favourable circumstances relief is given by the rushing out of the gases. Unfortunately, this operation is not always successful, as the tube becomes plugged up with the fermenting food, then resort must be made to puncture of rumen.

I have mentioned this operation at length, as it is a remedy for a choking beast, that is, one that has some obstruction in the gullet. In that case the probang is used as mentioned above, and the obstruction gradually pushed down into the stomach; instead of the probang a flexible cane may be used, such as a whip handle, for removing obstructions.

The Puncture of the Rumen.—This operation is usually performed with a trocar and canula, which consists of two parts stiletto and canula, the stiletto being a round or slightly flattened piece of steel, terminating at the end in a sharp, triangular point, and the other end fixed into a handle; the canula is a metal tube, closely fitted, and covering nearly the whole of the stietto, with the exception of the pointed end; the end next the handle has a shield to prevent the canula from falling into the stomach when the stiletto is withdrawn after puncturing. The seat of the operation is on the left flank, and in fixing the spot, one imagines a line drawn from the point of the hip parallel with the back bone, and the trocar is inserted four to six inches in front of the point of the hip on this imaginary line, but there is usually no trouble in locating the spot, as it is here that the bulging of the paunch is most prominent. Usually one has no time to cleanse the seat of the operation, but it is as well to do so if time permits.

The trocar and canula are now grasped firmly in the right hand (the operator standing on the right side to avoid the sudden rush of gas on the removal of the trocar), and thrusts through the walls of the abdomen and paunch with a rotating movement; if the animal's skin is thick, you may make a primary incision through the skin, about half an inch in length, and then thrust the trocar and canula in.

The stiletto is now withdrawn from the canula, and the gas rushes out. It is advisable to stop the rush of gases occasionally by placing a finger over hole in canula, as, owing to the release of pressure on the walls of the rumen, you may get a sudden rush of blood to the stomach, which causes loss of blood to the brain, with consequent swooning.

The trocar should not be removed too soon, as continued fermentation of the contents of the stomach may set up renewed inflammation, but the canula should be allowed to remain in some hours, stopped with a cork, which is occasionally removed to allow escape of gases, but the animal should not be left, for fear of the canula dropping out.

When removing canula the stiletto must be reinserted, and the whole slowly drawn out. The wound need not be dressed, except perhaps, after well cleansing, it may be covered with a pitch plaster or some tar.

In default of tocar or canula, and in case of emergency, one can operate with an ordinary pocket knife, introducing a couple of fingers to keep the wound open, and inserting a piece of glass tubing, or even a short piece of reed, with the pith cleaned out, as a canula for the escape of the gas. As far as one is able, all instruments should be clean and, if possible, boiled for ten minutes in rain water.

Also avoid allowing the gas to escape under the skin, which may cause diffused subcutaneous suppuration.

2. INDIGESTION AS RESULT OF OVERFEEDING.

This is a condition in which the paunch is over distended with food, by which the natural movements of the stomach are in an abeyance, and the food fails to pass onwards to the other stomachs.

Causation.—Generally from a too greedy consumption of food which is to the animal's liking, such as new hay, lucerne, etc.; also from fasting too long, or change of diet, from poor to good foodstuff.

It may often be seen in working oxen, which have been withdrawn from work and put on fattening food in preparation for the butcher, such as roots, beans, grains and foodstuffs in a semi-liquid state. These materials can only be digested in moderate quantities, and owing to the large amount of water they contain, rumination is hindered and

is not so complete as it should be, and food accumulates in the stomach, distending it, and eventually paralysing it.

Yet if the animal has not sufficient drinking water during the winter months when the grass is dry and non-succulent, the food becomes compacted into a dry mass, which the animal cannot return to its mouth for rumination, and also lessens the flow of saliva, without which the animal cannot chew the cud.

Symptoms.—These vary according to quantity and digestibility of the food that has been eaten. Usually one notices the following symptoms: loss of appetite, cessation of rumination, the animal arches its back, shows colic pains by kicking, and looking round at its abdomen, moans and groans, lying down and rises at short intervals, and occasionally passes at intervals small quantities of dung, which is firm and of a dark colour. The animal stands stupidly and seems oblivious of its surroundings. It will be noticed that if the animal has been affected for a day or two, that it may masticate without having any food in its mouth, and may try to eructate and to bring up its food for rumination, but without result. On palpation of the left flank, one will find that the rumen is tense, and sometimes filled with a doughy or very firm mass; on pressing into the mass the animal shows pain, as though the stomach was inflamed. Finally the movements of the stomach are entire suppressed, and breathing may be laborious, owing to the pressure of the solid mass on the lungs.

Course.—The course of the disease varies. If the stomach is greatly overloaded and distended one may get death from asphyxia and carbonic acid poisoning, as in gaseous indigestion; but again, the symptoms may last for some days, with complications such as inflammation of the stomach and bowels. Other cases may be only of a few hours' duration, and again others recover from treatment.

Differential Diagnosis.—It is not difficult. Indigestion from overfeeding is distinguished from gaseous indigestion by its less rapid course and less marked distension of the stomach, and from acute inflammation of the stomach and the bowels, by the rise of temperature, which occurs in the latter, whereas in the former there is hardly a perceptible rise at all.

Treatment varies according to cause, symptoms, etc. If of the acute type and caused by overgorging with lucerne, etc., proceed as in gaseous indipestion, that is, puncture the rumen and give frequent doses of epsom salts—1 to 1½ lbs. daily—until the stomachs are empty. The after treatment is to feed lightly with easily digested food, and give thin porridge made of mealie meal and other mucilaginous drinks.

When impaction is not of an acute form, doses of epsom salts may be given, and the animal exercised daily. In severer cases one should try to stimulate the stomach externally by massage, by kneading and rubbing the left flank, for some considerable time, at the same time giving purgatives, such as linseed oil, 1½ pints, epsom salts, 1½ lbs., or sulphate of soda, 1 to 1½ lbs. In the treatment of this disease it is always advisable to give warm enemeta, to aid defaecation. Finally, there is an operation which can be performed as a last resource, called gastrotomy, that is an opening made into the rumen, and a portion of the accumulated food is removed, but the result is not always satisfactory and would be rather difficult without professional help.

To Give Enemata.—The apparatus for admininistering enemata consists of a pump, tube and nozzle; an ordinary spray pump can be used.

The animal is held by assistants, and the hind legs strapped together, as in milking an obstreperous cow.

Warm soapy water at body temperature is as good as anything to use for the injection, and as much as half a bucket may be pumped into the rectum without harm.

The nozzle is first of all well soaped, to allow easy entrance to the rectum and pushed up to whole length of nozzle.

3. CHRONIC INDIGESTION.

This is a form of indigestion characterised by the drying and impaction of food between the folds of the third or leaf stomach.

Other names for the disease are: clew bound, fordel bound, grass staggers, stomach staggers, and dry murrain.

Causes.—Suppresion of salivary secretions, the absence of liquid flowing from the mouth or paunch to the third stomach,

thus causing dryness of the ingesta therein, and consequent impaction.

The third stomach, like the first and second, depends entirely on the saliva and liquid taken in by the mouth for its supply, and should feeding rumination, and secretion of saliva be arrested, and overflow into the third stomach from the rumen checked, the ingesta, or food in this stomach loses its moisture and becomes converted into a dry or powdery mass. All fevers or inflammatory affections tend to cause this form of indigestion and cause the contents in the third stomach to become dry and powdery. Another cause is giving dry fibrous innutritious food, as during the winter months the grass has lost its succulent condition. It also occurs when feeding on mealie stalks, or corn affected with smut or ergot; also on grasses which are also affected in the same way. All these causes are aggravated when the water supply is insufficient or restricted.

Symptoms.—The form usually seen is when an animal has just recovered from a fever; there is failure to re-establish regular ruminatioh, the animal's appetite is irregular, the mouth dry, spirits low and inclination to blow, and may even be accompanied by moaning, the animal's mouth is hot and nozzle dry, constipation is usual and the animal defaecates in small hard quantities, perhaps covered with mucuous and streaks of blood, but in other cases you may get diarrhoea to start with followed by constipation and, as in all fevers, the coat is staring and dry. In cases where there has not been previous disease, the animal will show the following symptoms:—Diarrhoea followed by constipation and symptoms mentioned above. Usually found lying on left side, nose in flank, breathing is quickened and accompanied by grunting, and walks in a weary, listless manner, dragging its limbs. A common symptom in this disease is grinding of the teeth. As in all disorders of the stomach the milk falls off in quantity until eventually the srcretion has completely stopped. This form of indigestion lasts several days, running into weeks, and naturally emaciation advances day by day until eventually you get paralysis of the hind limbs, stupor, or delirium and convulsions.

Course.—Chronic cases may run into weeks, and with consequent loss of condition and eventually death. In more

acute cases where recovery is early, there occurs abundan diarrhoea followed by general improvement in health, rumination becomes regular and the appetite returns.

On post mortem one finds that the third stomach is abnormally large and choked with solid dry caked food which, when removed from between the folds or leaves comes away with pieces of the membrances attached. The paunch is packed with putrid swelling ingesta and the true stomach, or fourth stomach, is empty, but is usually inflamed, and the large gut contains slimy pellets of dry food covered with mucous.

Treatment.—Much the same as in indigestion from over-feeding. Epsom salts and glauber salts daily until action of bowels takes place. Bucketfuls of thin linseed tea is good for them to drink, and in any case liquids should be freely given. Should the constipation be obstinate, twenty drops of Cronton oil may be added to the 1½lbs. of Epsom salts and frequent enemeta given. When the bowels are well opened then laxative foods such as bran meshes, green food, plenty of rock salt for them to lick should be given. A good tonic pick-me-up containing one dram of nux vomica, two drams iron sulphate, and two drams of powdered gentian may be given in a bottle of gruel twice daily; this will be of great assistance in restoring the normal functions of the stomach.

4. MILK INDIGESTION.

This is an indigestion which affects calves, and naturally the fourth stomach is the one affected, as it is the only one that is active during the calves' first few weeks of life, and until weaned, the other compartments do not greatly develop.

Cause.—A common cause is when there is too long an interval between the feeds, and then calves being hungry and naturally greedy over gorge themselves with too much milk, especially amongst those whose mothers are not milked, but all is given to the calves.

The stomach becomes over distended, and the supply of digestive juices becomes disorganised, and the first stage of digestion is incomplete, giving rise to the so-called milk indigestion. Again, in cows which are worked in the yoke

the milk secreted is less digestible than the normal supply, acting as an irritant to the calves' stomach. Another cause is when the calves are fed by hand, as often the milk given is twelve hours old, or skimmed, or perhaps even butter milk; milk of this kind contains toxic substances which act as irritant to the calves' stomach — hence indigestion. Certain diseases of calves, such as redwater, liversickness, etc., are prediposing causes to this form of indigestion.

Symptoms.— The calf at first may show slight colic after feeding, and is usually dull and sleepy. This is often followed by attempts to vomit, and a quantity of curdled milk is brought up.

Pressure on the right side of the abdomen causes pain. Should the animal vomit, it is immediately relieved and seems brighter, but after a time, when this form of indigestion has persisted, the animal becomes more depressed and sluggish in its movements, the mouth emits a sour odour, and the appetite becomes poor, and then diarrhoea begins, and the animal goes off in condition, staring coat, etc., and eventually the intestines become affected with consequent diarrhoea, and inflammation of the bowels, followed by wasting away and death.

Treatment.—This condition is not serious, if attended to at once, but should it get as far as diarrhoea, enteritis, then the condition is serious. To prevent recurrence, regulate feeding and, if cows are worked, work them as little as possible, better not at all. Avoid giving old, skimmed, or mixed milk. Curative treatment, put the animals on low diet for a day or two, or giving them boiled milk, half diluted boiled water, small doses of sulphate of soda, ½—1 oz. may be advantageously given in food. Should indigestion follow redwater, it is often advisable to treat the original cause by giving either small doses of methyl arsenate of soda—5-grain doses—or by intravenous injection of a solution of trypanblue.

This often effects a cure, especially if the animal is carefully fed and well nursed.

Notes from the Agricultural Laboratories.

ABNORMAL DEVELOPMENT OF MAIZE COBS.

Plate 2 illustrates a somewhat curious growth which has been in marked evidence in many of our maize fields this season, and several correspondents have made enquiries regarding the probable cause. Reports indicate that this abnormal growth has been more noticeable in this year's crop than previously, but it is nevertheless difficult to give an entirely satisfactory reason for its appearance. From observations made of a large number of crops throughout Southern Rhodesia it would appear that many individual plants, more particularly when grown on rich lands, have a tendency to form three or four cobs from different nodes on the stem. This is not a desirable feature, as two at least of these are usually barren, or at best but worthless nubbins, and only serve to draw on supplies of nourishment which would better be employed in the formation of one or two good cobs.

In the case illustrated, eight abortive cobs sprang from the same node, three of which were haemophrodite and none showed signs of forming more than a few malformed grains. The main cob was normal, but appeared to owe its infertility to the secondary growth of cobs.

Two explanations of this abnormal appearance are suggested—(a) a check in plant development due to prolonged drought at the time of formation of the first cob, followed by a renewed and luxuriant vegetative growth later in the season; or, (b) degeneration, due to insufficient care in seed selection.

As has been said, the maize plant in Southern Rhodesia frequently shews a tendency to excessive vegetative growth, and the abnormal development referred to appears particularly noticeable when seed selection has not received the care and attention that it deserves. At the same time, the drought of the past season may be accountable to a greater or less degree, and experiments are being arranged to

investigate the matter further. An important aspect of the case is that if such growth is due to degeneration of type, then it is probably a transmissable character and may be even more apparent next season, in which case the fact that such abortive cobs do not set seed will not in itself be sufficient safeguard since the influence of pollen from the male flower on the surrounding plants must be borne in mind.

Farmers whose crops have suffered in this way are invited to communicate with the Department, and any additional information on the subject will be welcomed.

H.G.M.

A NEW FODDER PLANT

(Pennisetum up?)

We are indebted to Mr. E. G. Kenny, Native Commissioner, Gutu, and to Colonel Napier, of Springs, Bulawayo, for a very interesting report on a native fodder plant known to the former as *zinyamunga* and to the latter as *marambagunda* or *dombamunga*. The plant was first noticed by these gentlemen about two years ago when it was seen growing in the Gutu district in native lands, and being used, as the natives explained, as a *muti*, or *mushonga*, to make the other crops grow. There is no record of its origin, nor does it appear to be known in other districts, though should this be the case we shall be glad to receive particulars regarding it.

Plate No. I shews one stool of zinyamunga, or Napier's fodder, as we now propose to name it. Colonel Napier is standing in front and, as can be seen, the height of the plant is well over ten feet. The material at present available is not sufficient to allow of the botanical identity of Napier's Fodder being definitely determined, but it appears to be a species of Pennisetum, and in some respects resembles Pearl Millet, *munga n'youti* (Pennisetum typhoideum). The plant is perennial, culms ascending from a much branched and apparently often decumbent base, eight to ten feet high. The main stem is somewhat woody and resembles cane, but often seems to throw out small lateral branches. Like Pearl Millet it is reported to be an extremely good drought resister.



Abnormal Development of Maize Cobs. *(Plate No. 2).*



A New Fodder Plant. (Pennisetum up.?)

Col. Napier and Mr. Kenny both state that it remains green on dry land late into the autumn and withstands frost to a remarkable degree. Col. Napier has tested it under most severe conditions and is firmly convinced of its economic value. He has now several acres planted on vlei ground on the Central Estates, and is hopeful that in spite of frost it will afford green feed late into the winter. Both cattle and horses eat it readily.

Like sugar cane the plant may be propagated either by subdivision of the roots or from cuttings or slips. It roots freely and is reported to grow rapidly after each cutting, thereby enhancing its value as a soiling crop. It seems probable therefore that in Napier's fodder we have found a hardy perennial plant of considerable value for winter feed and suitable for planting on light dry soil.

The Agricultural Chemist of this Department has made the following analysis of a mature stalk of Napier's fodder which arrived at the Laboratories in a partially dried condition, shewing that it is comparable in feeding value to maize stalk roughage:—

	%
Water	55.33
Ether extract	0.84
Protein	3.10
(Total nitrogen converted to equivalent in protein.)	
Carbohydrates	21.16
Fibre	15.66
Ash	3.71
	100.00
Ether extract with chlorophyll removed therefrom	0.57
True Protein	2.11

Col. Napier has formed so high an opinion of this crop that it is certainly worth a trial in other parts of Southern Rhodesia, and through his co-operation this Department is able to offer a limited number of roots f.o.r., Gwelo, under the usual terms of co-operative experiments. That is to say, any farmer receiving a free issue of roots undertakes to

report to the Department on the result of the experiment on farms supplied for that purpose. Applications may be addressed to the Department of Agriculture, Salisbury.

CHEMICAL.—MANURES.

Owing to the high price of fertilizers in Rhodesia their use is for the most part restricted to certain crops, more especially tobacco. To judge by the number of samples received at the Laboratory for a report as to their manurial value, one concludes that many of our farmers are not unmindful of the fact that by continuous cropping without the application of manures, a time will come sooner or later when the soil will no longer yield a profitable return; once that stage has been reached it is, as every practical farmer knows, a long and costly undertaking to bring the soil back to a fertile condition.

Amongst the samples examined were:—

(1) Deposit in an old kraal, Bubi District.

This material gave the following analysis:—

Stones	...	...	2.61 per cent.
Fine Earth	...	...	97.39 ,,

Percentage composition of fine earth (portion passing through 3 m.m. sieve), airdried.

Moisture lost at 100°C		...	6.22 per cent.
Loss on ignition (organic matter and water of combination			23.78 ,,
Nitrogen	...	...	0.249 ,,
Phosphoric oxide	...	...	1.03 ,,
Potash	...	...	0.29 ,,

This material constitutes a very useful manure which in an airdried condition compares favourably with average farmyard manure produced in England. An application to arable soil, particularly if low in vegetable matter, should produce very beneficial results.

(2) Woodashes.—The valuable manurial constituents of wood ashes are lime and potash, phosphoric oxide being also

present in small quantity. The analysis of a sample sent in from the Bulawayo district is as follows :—

Lime	49.33	per cent..
Phosphoric oxide	0.88	,,
Potash	0.65	,,

The ashes had lain in an exposed heap with the result that a large proportion of potash and phosphoric oxide had been leached out, the percetage amounts of these ingredients present being much lower than usual. The lime was chiefly in the form of Calcium carbonate. An application of the material to sour land or land deficient in lime should give beneficial results. In order to prevent the leaching out of soluble manurial constituents, wood ashes should be protected from rain as much as possible by such means as a covering of earth a few inches deep.

(3) Antheap containing lime. Salisbury district :—

Sample A.	per cent.
Silica and refractory silicates ...	65.29
Iron oxide and alumina	7.54
Calcium carbonate	17.76
Magnesium carbonate	0.01
Undetermined (water organic matter, etc)	9.40

Sample B.	per cent.
Silica and refractory silicates ...	81.07
Calcium carbonate	2.84
Magnesium carbonate	trace

Sample A. was very carefully taken. If B. is an average sample of the antheap, which is somewhat doubtful, its lime content is too low to warrant the expense incurred in its application. Unless the lime nodules in the material from which A. was taken can by some means be economically broken down, it is questionable whether it will pay to use it. The fact that the lime occurs in the heap chiefly in the form of small nodules, renders a direct application of the material less effective. It has to be borne in mind that a dressiug of lime in a fine condition is productive of much better results than when it is applied in visible pieces.

I had occasion recently to examine a sample of soil which had manifestly been dressed with very coarse lime, and in

spite of the fact, the soil showed a pronounced acid reaction, indicating that the lime had so far failed to exercise one of its most beneficial actions—that of sweetening the soil.

CASTOR OIL.

That the castor oil plant can be grown in Rhodesia to yield seed containing a satisfactory percentage of oil is indicated from a determination of the oil content (ether extract) of a sample of castor beans grown in the Bulalima District. This seed contains 50·1 per cent. of oil.

The most important sources of castor beans are East India, Mexico, the Mediterranean countries, and the United States of America; East India being the chief producer—beans from these sources contain 46 to 53 per cent. oil. At present there appears to be some difficulty in finding a market for castor beans in South Africa, although a considerable quantity of castor oil is consumed in the country for lubricating heavy machinery, etc.

G.N.B.

Poultry.

PREPARING BIRDS FOR THE SHOW.

By PHILIP L. HALL, Lenham Farm, Syringa.

[CONTINUED.]

By the time this number of the Journal is published the Show season will be close upon us. A few words on modern poultry shows, together with a few hints on showing, will I trust be in time to be of some service to my readers. Every year shows a steady increase both in numbers and quality of the birds seen at our various shows in Rhodesia, but a very great deal can be done to place the birds before the judge in their very best condition to meet his eye. All poultry fanciers will greet the announcement that outside judges will officiate at the principal shows, with satisfaction. In a small community like ours it is very necessary that a judge should be brought from a neighbouring colony in order to avoid any friction among the exhibitors. I do not for one moment intend to infer that we could not find good unbiassed judges among ourselves but there is always the fear of his decision being challenged by dissatisfied exhibitors with the inevitable result of a decreased entry the following season.

Whether or no it be possible to extract a profit from exhibiting poultry is a mercenary and professional question, but it is often asked and very seldom answered. There are so many ways of looking at it, and so many different kinds of people who do and should look at it, that it really becomes extremely difficult to answer. For instance, there is the small poultry keeper who tries to breed winners within the narrow limits of his backyard, and partially—or shall we say wholly?—succeeds. Is it possible for him to extract a profit? Personally, I should imagine that he of all people would extract the least gain out of exhibiting. In the first place, it must cost him more than anyone else to produce his birds. In close quarters they want unusual care and attention; they must be fed judiciously, if they are to be brought forward in that scupulous condition, the attainment

of which may be considered the keynote to success. Moreover that attention and that particular feeding must be no spasmodic affair instituted a week before the show, and discontinued immediately after. It must begin when the chick is hatched. Besides the cost of such feeding there are other expenses—washing appliances, training pens, the entry fees and railway charges, which together mount up to a tidy sum. What is at the end of it—a firt place? Doubtful.—Doubtful, decidedly, for these backyard people can seldom depend upon even there best birds gaining a prize unless the competition is purely local. Occasionally they win a first, but more often it is a second or a third, or, it may be a card of commendation. Their return is probably the nominal one of 2s. 6d., upon which they may stand to lose a shilling. I am inclined to think there is much better sportsmanship and much better feeling in such competition than where a breeder without opposition scoops the board. Certainly the mercenary and professional question does not dominate the situation, for the backyard fancier calls himself an amateur, and he generally is one. Who then does make exhibiting pay? That also is difficult to answer. Of all the various classes of exhibitors I fancy the downright professional makes the most out of it. I mean the man who buys and shows, but breeds little. I do not think we are far enough advanced in the poultry fancy to have that class of gentleman amongst us in Rhodesia.

To the ordinary fancier who shows for the love of showing, and with no particular desire for pecuniary advantage, it is not necessary to worry about aught but putting his birds down in the best possible condition and getting them to the show. It is always advisable for the amateur to limit his operations to his own locality. It is always much better if he can personally attend because in the words of Mr. Micawber "Something may turn up—something may confidently be expected to turn up." And often it does.

Much unnecessary and untruthful matter has been written on the arts and practice of washing. Many people have read such matter, and my vivid imagination pictures to me some of them, novices, in the act and attempting the art of washing. I can see them trying extremely hard to follow the directions of the book. I can see them buying innumerable things from innumerable shops; I can see them remem-

bering some and forgetting exactly how to use the others; I can see them consulting the directions at an unpropitious moment, nay, perhaps a fatal one, mixing in so doing, the bird, the directions, the water, the soap, the towels, and anything else handy and mixable in hopeless confusion; I can see them also ruining everything at a blow and washing nothing. All of which has hapened literally to myself, and is happening I dare say, to somebody else on the day this appears in print. Ergo, one is inclined to give "The Practice and Art of Washing" premier place in treating of the practical side of modern showing.

Now washing is really a very simple matter—far simpler to perform actually than to describe on paper. The equipment is as follows:—Three washing baths of three ordinary sizes, one cake of Sunlight soap, one "disher," bag of "blue," three towels and one exhibition bucket or box for every bird washed, not I think a very elaborate nor expensive equipment. The "disher" item is perhaps a little vague, It partakes of the nature of a saucepan, has a handle and is known to shopmen as a hand bowl. The best place to wash in is an outhouse of some kind, and the best thing to wash on is undoubtedly a kitchen table. About half a cake of soap is required for a wash, and this should be cut into strips placed in a saucepan, and the latter filled with water, and allowed to boil. The boiling soapy water should then be poured into the biggest bath containing already a certain amount of hot water. This latter should fill about three parts of the bath, and should be just comfortably hot to the hand. The second bath may be slightly cool, and the third —in which a small quantity of "blue" may be dissolved—absolutely cold.

All things being ready and the fire alight, and a supply of towels at hand, the first victim must be without delay immersed. The immersion must be thorough, not half hearted, and the soap must be rubbed in—the right way of course—not merely allowed to filter into the feathers. When the fowl has been thoroughly soaped, it must with equal thoroughness be unsoaped in the next bath. This perhaps is the most important part of the washing, and the only part that can be called at all tricky. If soap is allowed to remain in the grain of the feather, then indeed all is lost. The bird will not web out properly; the bird, washed badly,

will look far worse than it would have looked had it not been washed at all. Here, therefore the novice must be extremely careful, and if necessary he must be prepared to replace the water in his second bath with some fresh. The plunge into the third bath must be brief, but the whole body and head must be submerged. Afterwards the bird may be swung four or five times in the air, the swinger taking care to do so in an open place. This starts the drying process, and that process is still further accelerated if the surface water is squeezed out of the fowl before the towels are brought into play. So much for washing. As for drying, all that is necessary after the towel process is completed is to leave the drying birds in their baskets, taking care they are not nearer than three yards to the fire. In the morning they will—or should—be beautiful to behold, not fully webbed out perhaps, but still very good to look upon. We will conclude that there are some three days to elapse before the show and during this period the final training must take place. Of course, there must have been some preliminary training, or rather conditioning; one cannot prepare a bird for a show in a minute or yet in a day. Nowadays condition plays such an important part in the successful exhibiting of a bird that only two or three weeks special feeding will ensure its being put down in first rate form. Personally, I think the finest "conditioner" is milk, and from what I have seen among big exhibitors in England and Wales I should say this opinion is shared by a good many. The extraordinary value of it in this direction is, I believe, known to but few amateurs; at any rate, very few take advantage of it in any useful way. To be really efficacious milk must play a part in almost everything the fowl eats or drinks for at least a fortnight. The drinking troughs must be filled with it twice a day, and the mashes must be mixed entirely with it. Given this continually the birds that are intended for show will quickly come to hand and be in prime condition when they are wanted. The other items of dieting should be quite as usual. Special dieting or extra feeding are quite unnecessary and indeed undesirable, because show fowls thrive far better if they are treated like ordinary beings, save in such particulars as have been already mentioned; and this is my experience that the more more one fusses about one's best birds the worse they fare and the less keen become their appetites. They must be kept clean however

and everything around them be perfectly sweet; time spent in attending to these matters is time well spent.

To resume at the point where the birds are awaiting final attention before dispatch, it should be observed that tameness and adaptability to the show pen are important factors. Not only does a tame bird show off its shape and other points far better than a wild one but it must be remembered that a judge will as a rule give preference to one that shows itself, over one that does not. Therefore tameness must be encouraged n every way, and the best way to encourage it is by frequently using a judging stick, and by constant (though careful) handling. Heads and legs should be well washed just prior to dispatch. The use of soap and a brush will considerably brighten up face and comb, and if a little vaseline be applied to these and the legs after washing, the hopeful exhibitor may rest assured that everything possible has been done in the way of preliminary preparation. There are however, one or two mistakes that the person is apt to make in his most hopeful moments, one of them being to put a cockerel in a pullet basket and vice versa, thus entailing the risk of the birds being penned wrong; another to write his address vaguely or insufficiently on the return part of the label. Both points must receive due attention, because carelessness in showing leads to as many blunders as it does in any other pastime or profession.

A Visit to Ransomes' Plough Works.

By E. F. SHEPPY.

Through the courtesy of the Directors, I was able to see over the very large works of Messrs. Ransomes, Sims and Jeffries, Ltd., Ipswich, the principal British firm who devote much attention to the manufacture of Agricultural Implements suitable to the requirments of Rhodesia. They have regularly studied, through their experts, the local necessities of the farmers on the spot, and the improvements and modifications required, and our loyal colonists can always obtain from them British made goods of high quality.

This firm has recently brought out the Conqueror Disc Plough, which is made of special strength for breaking new ground, and without any unnecessary weight.

This plough has all the good qualities of their well known standard Disc Plough, and like it has an optional addition which will appeal to many farmers when cross-ploughing late in the season, viz., it can be fitted with a Mealie Planter which, on a three or four furrow Disc Plough, will effect a great saving of time.

They are large makers of one and two-row Mealie Planters, and their expert informed me that he is inclined to keep to the first idea of plates with spaced holes, as against the edge-drop principle, on account of the trouble experienced with very large flat mealies, which the edge-drop system cannot deal with satisfactorily, and which leads to very irregular planting. He contends that if the holes are sufficiently large for the class of mealies selected there can be no possible trouble or disappointment. The Planters have double flange wheels, and are very strong, and it is only necessary for it to be generally known that British Mealie Planters can be had to ensure their full share of patronage.

Their breaking plough, the Jumbo, an implement of tremendous strength, with loose fore-carriage will be of great assistance to men wishing to specially prepare new areas, and their double furrow plough, named the R.S.A.D., which is specially recommended for Rhodesia, has lately been further improved and cosolidated, and is likely to quickly become a very popular implement.

I was informed that they were bringing out, later in the year, a new special Disc Harrow for Rhodesia.

Perhaps the most interesting machines in all their Works, from the Rhodesian point of view, are the small Power Mealie Shellers, which can shell 700 bags of mealies per day if the mealies are husked.

The number of Thrashers and Steam Ploughing Tackle being turned out for the Argentine, Australia, and in fact for all and every part of the world, seemed to me most wonderful, and account for the number of hands, over 2,500, employed on the manufacture of these machines and all classes of Ploughs, Cultivators, etc.

The machinery for the manufacture of every small part is indeed ingenious, and the visit was most instructive as well as intensely interesting.

Setting Eggs.

A correspondent, Mr. F. W. Brooks, kindly sends us the following hints, which will, no doubt, prove of interest to many poultry keeping readers.

1. Whenever possible have the eggs carefully CARRIED to the place where the eggs are to be hatched as when sent by cart, rail, or post; their germinating power is often destroyed or impaired.

2. Allow eggs to rest for twenty-four hours before setting.

3. Set the hen at night in a well ventilated, semi-dark place, apart from the other fowls. In warm weather set her in the open, in a quiet, well sheltered spot.

4. Use a nest box without a bottom. Make the nest upon the ground, scoop out the earth saucer shape, and line the hollow thus formed with cut straw. Do not place too many eggs in the nest; it is important to have all eggs well covered.

5. Before setting, examine the hen for insects, and if infested, dust her thoroughly with insect powder. A hen covered with vermin sits badly, and in due course the chicks also become infested; they do not thrive, and the result is often fatal.

6. Make certain that the hen comes off the nest daily to feed, and that she is provided with hard corn, fresh water, grit, and a dry dust bath. She may remain off the nest from ten to twenty minutes, according to the season of the year. Daily cooling of the eggs is most important.

7. Test the eggs on the seventh day, when infertile or addled eggs containing dead germs, may be removed. Test at night by holding the eggs up to a strong light, such as a candle flame, when its contents may be seen. An infertile egg will appear quite clear, like one newly laid. In a fertile egg, on the seventh day, a dark spot will be noticed floating towards the broad end of the egg.

8. Broken eggs should always be removed from the nest, and the remaining eggs sponged clean. For this purpose warm water should be used.

Cookery for the Country.

(By L. C.)

TINNED MEAT RECIPES.

SALMON LOAF.

Mix together two tablespoonfuls melted butter, ½ cup of breadcrumbs, 1 tin of salmon (freed from bone and skin and superfluous oil), a pinch of salt, a liberal dash of paprika, and 2 eggs well beaten. Put the mixture into an empty tin, well buttered inside (a 1-lb. baking sowder tin makes a good mould), and steam for one hour. Turn out and cut into slices: serve either hot or cold; if hot, with Hollandaise Sauce; if cold, with a thin slice of lemon on each slice.

Hollandaise Sauce for above:—Beat together 2 eggs, 4 tablespoons tepid water, ½ teaspoon of salt, a dash of cayenne or paprika, and stir over the fire until as thick as custard, then take off, add a tablespoonful of lemon juice and serve.

BULLY BEEF GLACE.

Peel and cut a cucumber into thin slices: on each slice lay a ½ inch thick slice of bully beef cut to the same size and shape (these could be stamped out with a tin cutter) and on top of that another slice of cucumber. Arrange these on a flat dish close, but not touching. Then put two tablespoonfuls of butter into a saucepan and melt, add two teaspoonfuls of flour and stir until the flour is slightly browned, then add two cupfuls of stock (or Bovril) highly flavoured with salt, pepper, cayenne and mixed herbs powder; if necessary add a few drops of colouring essence to make it a rich dark brown, and stir until well thickened. Lastly, add 1 oz. of gelatine, previously soaked in a half cupful of cold water for an hour, and stir until the gelatine is dissolved: strain through a coarse sieve and put on ice until it is just beginning to set. Then pour it over the slices of meat and cucumber, putting it on with a spoon until each is well coat-

ed. Stand the whole on ice until quite firm, then trim the circles from the surrounding jelly on the dish, and dish them on a bed of lettuce, withsprigs of parsley or watercress or nasturtium leaves. If desired, a small star of pickled gherkin or cucumber may be placed on the centre of each round just before putting it on the ice.

CHICKEN POT PIE

1 chicken.
½lb ham or bacon.
¾ pint stock (or water).
3 lbs. potatoes.
½lb. Spanish onions.
1 tablespoon butter.

Salt, pepper, and flavouring to taste.

Part boil the potatoes in salt and water for 10 minutes, and then cut in rounds almost an inch thick. Peel and cut the onions in rings: cut the ham or bacon into squares, and the chicken into joints. Fill a casserole (or an ordinary tin billy with t'ght fitting lid will do) with alternate layers of potato, chicken, ham, onion, sprinkling a little seasoning over each layer. The top layer should be of potatoes with the slices overlapping. Pour in the stock, put the butter in pieces over the potatoes, put on the lid, and bake in a slow oven for three hours. Remove the lid for the last half hour to let the potatoes brown.

VEGETARIAN DISHES.

SAUSAGES.

3 ozs. breadcrumbs.
4 ozs. boiled rice.
3 tablespoons cold oatmeal porridge.
2 tablespoonfuls rice flour.
1 onion.
2 ozs. butter.
1 teaspoon powdered sage.

Slice and boil the onion, and boil in a little water until quite tender. When boiling stir in the rice flour gradually, and stir until the whole is a tick paste. Meantime melt the butter in another pan, mix in the breadcrumbs, and let them brown, stirring occasionally. When a nice rich brown, mix them with the rice and onion paste, also stir in the boiled rice and cold porridge, and flavour well with salt,

pepper, and the powdered sage Dip the hands in flour and make the mixture into small sausages rolling them on a flour board. Egg crumb, and fry in boiling fat. If possible serve with some good brown gravy, and some red-currant jelly.

SAVOURY MUSHROOM PIE.

Rub ¾ lb. of well boiled haricot beans through a sieve, add a tin of mushrooms (Black Leicestershire are very good for this) very finely minced, a shalot or small onion also finely minced, pepper and salt to taste, and the yolks of three eggs. Melt in a deep pie dish an ounce of butter, pour in the mixture, and bake for about half an hour. Meantime beat the whites to a stiff froth, add two teaspoonfuls of Worcester or other sauce, beating it in gradually, spread lightly over the pie and return to the oven to set and lightly brown the white of egg. Serve quickly.

Reviews.

A STUDY OF THE AGRICULTURAL SOILS OF THE CAPE COLONY.

By CHARLES F. JURITZ, M.A., D.Sc., F.I.C.

In this work are collated the results of analyses, made by Dr. Juritz, assisted by the staff of the Government Laboratory, of 800 samples of soil collected in 65 districts of the Cape Colony. The book is divided into seven parts, comprising chapters on plant nutrition, methods of analysis, results of chemical analyses, comparison of soil extraction methods, geological relations and plant food, alkalinity of soils and physical composition of soils. The work has been most carefully compiled, and contains a record of analytical data, which to the scientific agriculturist contains very interesting and useful information. Much of this information will be of great value in agricultural practice as our knowledge of South African soil becomes more profound. To the soil chemist it will prove a valuable work of reference.

Chapter 5, which deals with the classification and composition of soils, according to geological formation, is particularly interesting, but in order that accurate comparisons may readily be made between the composition of soils occurring in various parts of South Africa, it is most desirable that a uniform method of soil analysis should be adopted. At present there is, unfortunately, a great lack of uniformity in this respect, which renders comparison of soils occurring in different Colonies very difficult. Whilst it is only possible to make a very broad generalisation on account of variation in composition; a comparison of analyses of Cape soils with those published of soils of the Northern Colonies, more particularly in the Transvaal, indicates a general similarity in composition, though in potash the soils of the Cape Colony do not appear to be so well provided.

Dr. Juritz and his collaborators deserve great credit for the work already accomplished, and with so much of great practical value still to be done, it is most necessary that adequate provision should be made for extending the scientific study of South African soils. G.N.B.

Dates of Meetings of Farmers' Associations, Southern Rhodesia

(SUBJECT TO ALTERATION).

Name of Association.	Place of Meeting.	Secretary.	1910.						
			June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Mashonaland	Salisbury ...	W. H. Williamson ...	4	2	6	3	1	5	3
Rho. Landowners' Farmers'	Bulawayo ...	Harry Hopkins ...	30	28	25	29	27	24	29
Manica	Umtali	P. B. Snashall ...	1	2	6	3	1	5	3
Midlands	Gwelo	M. L. Price ...	10	...	...	...	...	...	...
Lomagundi	Eldorado Mine ...	J. J. Reynard	11	9	13	10	8	12	10
Makoni	Rusapi	F. A. Lapham ...	8	13	10	14	12	9	14
Marandellas	Marandellas ...	A. J. H. Nicholson ...	4	...	6	...	1	...	3
Matopos	Matopos... ...	W. E. Dowsett ...	5	...	...	4	...	...	4
Plumtree	Plumtree ...	J. Reid-Rowland ...	...	7	...	...	6	...	...
Victoria (Eastern)	Good Hope Farm	F. A. Readman ...	...	...	6	...	...	5	...
Enkledoorn	Enkeldoorn ...	A. J. Liebenberg ...	25	30	27	24	29	26	31
Figtree	Figtree	J. T. Kirschbaum ...	...	9	...	...	8	...	...
Melsetter	Melsetter ...	H. A. Oxenham ...	...	1	...	...	7	...	...
Gazaland	Chipinga ...	A. L. Sclater	...	...	4	...	...	3	...
Hartley	Hartley	S. J. Knutzen	11	9	6	10	8	5	10
Mazoe	Mazoe	V. W. Fynn	5	...	...	4	...	...	4
*Makwiro and Norton ...	Makwiro ...	W. Shaw	...	...	...	...	...	...	...
*Macheke	Macheke ...	A. C. Fountain ...	...	...	...	...	...	...	...
*Victoria	Victoria	James Rutherford ...	...	...	...	...	...	...	...
*Kimberley Reefs	Kimberley Reefs ...	G. O. Smith ...	...	...	...	...	...	...	...
*Somabula	Dewhurst, Somabula	S. Annandale ...	...	...	...	...	...	...	...

Dates of Meetings of Associations marked (*) are uncertain.

Correspondence.

METHODS OF HARVESTING MEALIES.

The Editor Rhodesian Agricultural Journal.

Dear Sir,—In reply to your invitation for correspondence, and as I think I was the first to introduce the method into Rhodesia, I will give you the method upon which I have worked; *i.e.*, "The Curing of Mealie Stover and its attendant benefits." I employed eight natives with choppers, or small hatchets, who cut down the mealie stalk below the surface of the ground; this does away with the mealie borer trouble and leaves your lands fit for ploughing, even before the stooks are carted, if required. Then I drive in a stake at suitable intervals, keeping them in rows, and stand the stalks around the stake until a medium-sized stook is made; then I put a strand of bark round to keep the wind from blowing them down. After they have stood thus for two, three or four weeks, according to the weather, I give each native a piece of hard pointed stick about five to six inches long with a string round two notches in the centre. The stick is held in the palm of the right hand with the point between the thumb and forefinger, the string being round the middle finger; the mealie, still on the stalk, is grasped in the left hand, the point of the stick is inserted at the top of the cob the forefinger and thumb grasping the husk a sharp tug pulling half of the husk away, the remaining half comes away easily and a sharp twist detaches the cob. The straw is then carted away and stacked alongside the wire kraals for winter use, to be fed to the cattle at night. I cart the cobs after this fashion; the large, medium and small cobs are bagged separately. The large cobs are placed at the further end of the mealie hock, the medium-size in the centre, and the smaller ones near the door for immediate use.

I may say the above methods are the quickest I have yet seen, and the natives are delighted with the pointed stick which saves their fingers considerably. I make the mealie hock with wire woven with the Kitselman woven wire fencing machine. The size of mesh can be altered from mouse-proof to any desired size. The hock is raised above the ground on posts.

I am, &c.,

13th May, 1910. J. S. T.

Market Reports.

The London market prices for maize have improved slightly, while there has been a considerable reduction in the prices of wheat which, according to the latest advice received, are quoted at per 480lbs—maize, f.a.q. S. A. Yellow Round and White Flat 24/10½, and mixed 24/-; wheat, c.i.f. red 35/- to 38/-, and white 37/- to 39/-.

The local market is being well supplied with produce grown locally and prices remain steady, except in regard to mealies and rapoko, the prices of which are liable to cheapen.

The following are the latest market quotations received:—

Jas. Lawrence & Co. (Transvaal), Ltd., 11th May, 1910:—

Barley, per 150 lbs.	...	10/6	13/6	Peas, per 200 lbs.	...	10/6	12/6
Beans, per 200 lbs.	...	11/0	28/9	Potatoes, per 150 lbs.	...	3/9	14/0
Bran, per 100 lbs.	...	6/6	7/3	Rye, per 200 lbs.	...	9/6	12/0
Chaff, per 100 lbs.	...	1/6	3/6	Salt, per 200 lbs.	...	4/10	5/0
Forage (T'vaal), 100 lbs.		5/6	6/9	Boer Meal, sifted, per 200 lbs.	...	22/6	26/3
„ (O.R.C.)	„	3/6	4/6	Wheat, per 200 lbs.	...	13/0	19/6
„ (Colonial)	„	6/6	6/9	Butter, per lb.	...	10d	1/2
Hay, per bale	...	6d	1/-	Eggs, per dozen	...	1/6	1/10
Kaffir Corn, White, per 200 lbs.	...	5/0	5/3	Ducks, each	...	1/6	2/2
do. Mixed	...	5/6	6/6	Fowls, each	...	1/0	2/5
Lucerne, per 100 lbs.	...	4/9	6/3	Geese, each	...	3/8	4/3
Manna, per 100 lbs.	...	3/0	4/3	Turkeys, each	...	3/0	11/0
Mealies, (S.A.), White, per 200 lbs.	...	7/6	8/6	Pigeons, each	...	6d	8d
Mealies, (S.A.), Yellow, per 200 lbs.	...	8/6	9/3	Slaughter Oxen	...	£8/10	£12/-
Oats, per 150 lbs.	...	6/0	12/0	Sheep, per lb., dressed weight	...	4¼d	4½d
Onions, per 120 lbs.	...	3/6	9/6	Pigs, per lb.	...	2d	4d

FRUITS.—Apples, 2/6 to 11/- per 100; Bananas, 1/6 to 2/6 per 100; Naartjes, 3/- to 6/- per 100; Oranges, 2/- to 5/- per 100; Pears, 1/- to 11/- per box.

Hubert Morisse & Co., Johannesburg, 12th May, 1910:—

Barley, per 163 lbs	...	12/0	14/3	Lucerne, per 100 lbs	...	4/6	5/6
Bran, per 100 lbs, Colonial		5/9	7/3	Manna	... „	3/0	3/3
Chaff, best, 100 lbs	...	1/6	4/0	Transvaal Hay, bale	...	4d	10d
Eggs, per doz, Colonial	...	1/9	2/0	Oats, per 153 lbs	...	7/0	12/0
Salt, per bag	...	5/0	5/6	Potatoes, best, per 153 lbs		8/6	10/0
Forage, Transvaal 100lbs		5/6	7/0	„ med. and inferior		3/6	8/0
„ Colonial, 100lbs	...	6/6	7/0	Onions, Cape, 120 lbs	...	8/6	10/0
„ med. & inferior	„	3/0	5/0	Turkeys, Cocks	...	3/6	10/6
S. Meal, best fine, 203lbs		25/6	26/6	„ Hens	...	3/6	4/6
Rye,	... „	10/9	11/6	Fowls	...	1/0	2/6
Wheat	... „	13/6	20/6	Ducks	...	1/6	2/3
Mealies, Hickory King		7/0	8/1	Geese	...	2/9	4/6
Mealies, O.R.C. Whites	...	7/6	7/9	Pigeons	...	7d	9d
Mealies, Yellow	...	8/8	9/1	Butter, O.R.C.	...	10d	1/2
Kafir Corn, per 203 lbs	...	4/4	7/1	Pumpkins, each	...	2d	4d
Hay, Sweet, Transvaal	...	9d	1/3	Beans, per 203 lbs, Sound		11/6	39/0

LIVESTOCK.

Slaughter Oxen	£9/0	£13
Slaughter Cows	£6	£8
Milch Cows, Cape ...	£19	£25
Trek Oxen	£6	£7/15
Tollies	£4/5	£5
Sheep, Cape and Bastard	per lb	4d
" " ...	13/6	16/6
Sheep, Merino, per lb ...		4d
"	13/6	20/0
Slaughter Ewes	10/6	13/0
Lambs	9/0	10/6
Goats, Boer Kapaters ...	12/6	17/6
Pigs, live weight	2d	4d
Mules, large	£23	£30
Mules, medium	£17	£19/10
Mules, small	£14	£16
Horses, good	£16	£25
Horses, ponies	£9	£13
Donkeys	£5	£6/10
Heifers, 12 to 18 months	£5	£6
Heifers, 2 to 3 years ...	£6	£9
Cows, breeding	£7	£9/10

Jas. Lawrence & Co., Ltd. Kimberley, 6th May, 1910 :—

Bran, per bag 100 lbs ...	6/0	6/6
Barley, per bag 163 lbs ...	9/6	12/6
Beans, Sugar, bag 203 lbs	28/6	30/6
Beans, Kafir, 203 lbs ...	10/0	11/0
Chaff, Colonial, bale ...	6/6	9/6
Chaff, Colonial, pressed, 100 lbs	3/0	3/6
Forage, good, per 100 lbs	5/9	6/3
Kafir Corn, S.A., mixed	6/6	7/0
Kafir Corn, White ...	6/6	7/0
Boer Meal, Colonial, unsifted	23/6	26/6
Boer Meal, Colonial, sifted	26/6	29/6
Flour, Colonial, per bag 100 lbs	15/6	16/6
Yellow Mealies, Colonial, 203 lbs.	8/6	9/3
White Mealies, Colonial, hard, 203 lbs	8/0	8/6
White Mealie Meal, 183 lbs	9/3	10/0
Oats, per bag 150 lbs ...	9/6	10/6
Lucerne Hay, per 100 lbs	4/6	5/0
Onions, per bag 120 lbs...	4/6	8/6
Potatoes, new	6/0	8/6
Tobacco, good, per lb ...	4d	7d
Tobacco, inferior, per lb	1d	2d
Wheat, per bag 203 lbs ...	18/6	20/0
Butter, fresh, per lb ...	9d	11d
Butter, second quality ...	6d	8d
Eggs, per dozen	1/2	1/4
Ducks, each	1/10	2/0
Fowls, each	10d	1/4
Turkeys, each	4/0	7/6
Hams and Bacon, per lb		2d
Salt, per bag	3/0	4/6
Walnuts, per lb		6d
Dried Peaches, per lb. ...	2d	
Dried Apricots, per lb. ...	2d	
Lime, per bag	2/6	3/0
Apples, per box	1/0	8/0
Grapes, per box	1/0	4/6
Grapes, per basket ...	3/0	8/0
Pears, per box	1/6	6/6
Pears, per basket ...	3/6	8/0
Quinces, per basket ...	2/6	5/6
Quinces, per box ...	1/6	3/0
Beans, green, per lot ...	2d	4d
Cabbages, per dozen ...	1/0	6/0
Springbok, each	7/0	14/0
Stembok, each	4/0	6/6
Duikers, each	5/6	8/6
Hares	1/3	2/6
Paauws	4/0	10/6
Redwing	1/2	2/0
Koeran	1/6	1/9
Guinea Fowl	2/3	3/6
Namaqua Partridge, doz	5/0	7/0

SLAUGHTER.

Cows, good, 450 lbs upwards	£6/10	£7/10
Calves	£2	£2/10
Oxen, good, prime, 600 lbs upwards	£9	£10/10
Oxen, Trex	£6/10	
Cape Sheep, good ...	12/6	14/6
Lambs, 30 lb	7/6	8/6
Hamels, 40 lb to 45 lb ...	10/9	13/3
Kapaters, good, 60lb ...	13/6	15/0
Horses Riding & Draught	£12	£20
Mules	£20	£22/10
Donkeys, Geldings ...	£4/10	£6
Donkeys, Mares	£5	£6/10
Pigs, (clean), per lb ...	3d	3¼d

Wightman & Co., Ltd., Salisbury, 25th May, 1910:—

Mealies, per 203 lbs	...	10/0	10/6	Manna Hay, per 100lbs ...	6/6 7/6
Rapoko, per 203 lbs	...	10/0	10/6	Beans, per 200 lbs... ...	16/6
Oat Forage, per 100 lbs...		9/0	10/0	Monkey Nuts, shelled, p. lb	1¾d
Onions, per lb ...	...	2½d		do. unshelled, per 83 lbs	8/6
Potatoes, per lb ...	...	¾d	1d	Wheat, per 200 lbs ...	30/0
Munga, per 203lbs	...	11/0	12/0	Oats, per 153 lbs	29/0
Salt, per 200lbs ...	...	19/0			

Whitfield & Co., Salisbury, 25th May 1910.—

Cows, good milkers	...	£25	£35	Mules, inoculated ...	... £30 £35
Cows, Native ...	...	£8	£10	Mules, not inoculated	... £25 £30
Heifers, Colonial ...	...	£7	£8	Horses	... £25 £30
Heifers, Native ...	...	£5	£6	Donkeys, Colonial...	... £8 £9/10
Trained Oxen, large	...	£12	£12/10	Donkeys, G.E. African	... £8 £9
Trained Oxen, ordinary ...			£10	Sheep, Colonial ...	... 25/-

Weather Bureau.

Temperatures Recorded, 1910. (Means).

	MARCH.		APRIL.	
	Max.	Min.	Max.	Min.
Bulawayo	75.8	59.5	76.0	52.7
Chishawasha	77.0	59.1	76.3	51.9
Empandeni	79.0	59.8	80.0	50.6
Gwelo	75.9	58.3	75.2	49.0
Hope Fountain	75.3	58.8	75.2	51.8
Melsetter	69.7	...	71.2	...
Plumtree	72.4	59.1	75.9	54.0
Salisbury	76.5	58.1	76.3	51.7
Umtali	79.4	42.8	81.6	33.5
Belingwe	...	...	...	...
Gwanda	78.9	61.9	...	...
Rhodes Matopo Park ...	78.6	59.2	77.0	50.6
Selukwe	73.2	60.6	...	...
Tuli	85.0	...	71.6	...
Victoria	76.6	61.9	80.6	52.8
York Farm, Inyanga ...	71.2	53.5	72.4	47.6
Victoria Falls	83.5	64.0	83.6	57.1
Hartley	...	...	80.2	52.0

Records received of Rainfall at Stations in Southern Rhodesia, 1910.

	March	April
MASHONALAND—		
Brundret, Mazoe	10.47	1.03
Battlefields		
Banket Junction	6.83	
Borrowdale	6.72	2.93
Charter (Range)	7.74	0.26
Chilimanzi	15.15	
Chishawasha	9.57	2.44
Eldorado	7.85	
Enkeldoorn	5.23	0.40
Eagles Nest	10.10	0.75
Gadzema	4.41	3.30
Gatooma	6.63	
Gutu	8.68	0.15
Hartley	4.67	2.09
Helvetia	16.98	2.58
Inyanga (B.S.A.P.)	11.60	
Inyanga (York Farm)	9.46	3.77
Marendella	6.47	2.05
Monte Cassino	8.15	0.79
Macheke	10.73	0.47
Mount Darwin	3.66	0.94
M'Rewa	12.04	0.77
Melsetter	13.86	1.80
Mazoe South	7.96	1.15
M'Toko	6.32	
Rusapi	5.53	
Salisbury	9.23	2.92
Sinoia	8.94	0.07
Sipolilo	9.39	0.95
Stapleford		
Summerfield, Penhalanga ...	6.43	0.67
Utopia	6.80	1.28
Umtali	6.55	0.61
Victoria	5.71	0.30
West Ridge	7.98	

	March	April
MATABELELAND—		
Balla Balla	5.50	
Bembezi	8.67	
Bulawayo (Observatory) ...	5.47	0.03
Bulawayo (Govt. House) ...	6.64	
Belingwe		
Driefontein	5.38	0.85
Empandini	4.84	
Filabusi	4.79	0.22
Fort Rixon	4.61	0.09
Gwelo	6.65	0.48
Gwanda	10.39	
Gwaai	6.93	0.18
Heaney Junction	5.16	0.10
Hope Fountain	7.09	0.04
Inyati	8.03	
Insiza	5.98	0.77
Kariangwe		
Malindi	9.25	1.10
Maxim Hill	1.24	
Matopo Mission	9.72	0.05
Nyama Ndhlovu	12.48	
Plumtree	6.64	
Que Que	7.94	0.56
Rhodes Matopo Park	4.68	
Selukwe	10.53	1.50
Shawlands		1.16
Syringa	3.42	
Solusi		1.37
Tegwani	5.80	
Tuli	5.74	0.01
Umguza	6.44	
Umshabetsi Mission	7.16	
Victoria Falls	8.51	0.76
West Nicholson	4.54	0.20
Wankies	3.80	0.68

OBSERVER'S NOTES.

BRUNDRET (Mazoe)—March.—The mealies planted during the latter part of December have done very well on the whole. With a few exceptions the yield per acre in the district will

be about half as compared with previous seasons, but the acreage planted this season is very much larger, and probably the total maize crops will equal any previous season. Potato crops are excellent, tobacco fair. No horse sickness during the month.

April.—The maize crop in the district has again improved this month, and is likely to be larger than the farmers anticipate. There is hardly any disease or pest either in the way of rust or grub this season.

CHININGA (Lomagundi)—April.—The natives are busy harvesting maize crops which appear to be good. Kafir corn and rukweza, though good, would have been better if a little more rain had fallen.

EAGLES NEST—March.—Crops look better now than last month.

April.—All livestock looking well but the veld is turning dry.

MONTE CASSINO—March.—Mealie and other crops are not quite up to the same as last year, but nevertheless a fair average harvest may be expected. Cattle all well.

April.—Cattle in good health and condition. Mealies are maturing and harvesting may be begun soon.

M'REWA — April.—There was a decided change of temperature on the 21st from mild to cold winds, and on the 29th we had the first frost of the season, which was heavy enough in many places to destroy late crops. One 12 acre field of beans was completely blackened and as a rule we do not get frost here before the 14th May. Crops on the whole are good and both farmers and natives have commenced to harvest mealies. Rivers and streams are now running fairly strong, but vleis are drying up quicker than usual even with the late rains we had.

MOUNT DARWIN—March.—Crops generally may be considered satisfactory but not prodigious. All stock continues to prosper and no sickness recorded.

SUMMERFIELD —March.—European crops fair, native crops light. All stock in good condition.

April.—Crops late and running medium to light. Stock in fair condition.

FORT RIXON—March.—A very good month with soaking rains. Mealie crop well above the average. Potatoes good of which large crop planted. Stock in good condition. A few [illegible]s among calves from liver sickness and white scour.

April.—Early white frost on 12th and 13th, which cut off some late mealies, and has dried the grass up early for the time of the year. An average crop of mealies. Stock doing well. No disease.

Mean Temperatures recorded during the year ended 31st December, 1909.

	Mean Max.	Mean Min.	Mean Monthly Temp'ture.	Absolute Max.	Absolute Min.	Variations in Temperature		
						Great'st Daily Range	Mean Daily Range	Least Daily Range
Bulawayo	77.4	53.9	65.6	95.2	37.5	40.8	23.5	4.2
Chishawasha (1) ...	78.6	52.3	65.4	93.4	37.0	43.1	26.3	8.3
Empandeni	80.0	52.9	66.5	98.5	32.0	46.0	27.1	1.2
Gwelo	77.5	51.1	64.3	96.3	32.1	44.7	26.4	5.7
Hope Fountain (2)...	76.4	53.5	64.9	96.8	36.2	41.0	22.9	2.9
Melsetter	72.3	...	...	92.2	...	...	...	...
Plumtree (3) ...	76.6	55.1	65.8	94.8	40 9	34.1	21.5	6.1
Salisbury	76.7	53.4	65.0	93.8	25.0	39.0	23.3	5 8
Umtali (4)	81.0	37.4	59.2	94.2	25.0	59.5	43.6	30.5
Belingwe (5) ...	78.5	54.7	66.6	101.0	34.0	46.0	23.8	5.5
Gwanda	80.2	55.2	67.7	101.0	33.9	43.2	25.0	3.5
Rhodes Matopo Park	77.4	54.3	65.8	95.0	33.0	47.0	23.1	1.0
Selukwe	76.1	54.4	65.2	96.0	41.3	36.0	21.7	3.6
Victoria	79.6	54.6	67.1	98.8	33.0	49.5	25.0	1.7
Inyanga (York Farm	71.7	47.8	59.7	86.0	34.0	39.7	23.9	2.0

(1) 323 Days' Observations
(2) 360 „ „
(3) 345 „ „
(4) 350 Days' Observation
(5) 272 „ „
(6) 318 „ „

Veterinary Report for the Months of March and April, 1910.

SALISBURY.

AFRICAN COAST FEVER.—On 24th March, Mr. Dardagan, of the Brickfields, Salisbury Commonage, reported the death of an ox. From the post-mortem appearances and the results of microscopical examination of blood smears, there was, unfortunately, no doubt, that the beast died from African Coast Fever.

All cattle movements in the Goromonzi and Mazoe districts were at once suspended. Police posts were placed on and around the infected area, extra Cattle Inspectors were employed, and all cattle in the vicinity regularly inspected, dipped, and branded, and in the adjoining herds temperatures were taken daily.

Every effort was made to trace cattle whieh had been to the Brickfields prior to the outbreak, and in three lots of cattle suspicious cases were discovered, as follows :—

1. At Mr. Morgan's plot, at Avondale, where a span of ten animals, which had been working to and from the Brickfields, were under observation, three oxen showed high tempetatures on the 2nd April, and were destroyed, and on the following day a fourth beast was similarly dealt with. The remainder of the span was slaughtered by the owner.

2. On 3rd April an ox in a lot of three spans of transport oxen quarantined about four miles from Salisbury, on the Mazoe road, showed a high temperature, and was destroyed.

3. On 7th April three head of cattle were destroyed on Mr. Morgan's farm, Bitton, about 15 miles from Salisbury. These animals had been isolated, and, under observation for three days as showing high temperatures. In this case infection was attributable to the removal of some cattle, which had been at the Brickfields to the farm about 12th March.

In cases (1) and (2) no evidence of Coast Fever was found on postmortem or microscopic examination of blood and spleen smears. Such evidence, however, was not to be expected, as the animals were destroyed at the very beginning

of the fever. There can be little doubt that had the animals been allowed to live they would have developed Coast Fever and established centres of infection. In case (3) one beast showed distinct lesions of Coast Fever.

On 14th April an ox was destroyed on Mr. Ross' farm Gletwyn; a postmortem examination showed undoubted lesions of Coast Fever. In this case infection is attributable to the oxen having been outspanned near the Railway Station prior to the Brickfields outbreak.

On 25th April an ox was destroyed in Mr. McChlery's herd, Brickfields, on showing a high temperature. This herd was kraaled within half a mile of Dardagan's, and it was only to be expected that it would become infected sooner or later.

The process of temperature taking in the infected herds was continued, all animals showing a high temperature were destroyed whilst the remainder were slaughtered for meat purposes.

At the farm Bitton all the cattle were destroyed on the 9th April.

The cattle in the infected herds have been disposed of as follows :—

	Died.	Destroyed.	Slaughtered.	Remaining.
Mr. Dardagan, Brickfields	1	8	55	None
Mr. Morgan, Avondale ...	0	4	6	„
Mr. Morgan, Bitton ...	0	23	0	„
Mr. McChlery, Brickfields	0	6	26	„
Mr. Ross, Gletwyn ...	0	9	0	196
Herd, Mazoe Road ...	0	1	17	28

Immediately after the Commonage outbreak occurred the work of fencing off the infected area was undertaken. A barbed wire fence was first erected along the railway line from where it enters the Commonage on its south-western boundary to the Hillside road, thence it was carried along the Makabusi River to the eastern boundary of the Commonage. The Commonage boundary fence is also being erected, and that portion to the south of the Railway has already been completed. The Brickfields infected area is therefore entirely surrounded by the fence. Within the area there are a few lots of cattle, these are being moved to a temperature camp adjoining the commonage to the east, which has been fenced to receive them.

The fencing of the farms Bitton and Gletwyn is also being proceeded with.

It is not considered necessary to fence the areas referred to under Nos. 2 and 3 above, as no infection can possibly have disseminated by the animals destroyed.

There is a very prevalent idea amongst cattle owners that in the present outbreak the disease is not so virulent and does not spread so rapidly as formerly. This is not so, and cattle owners must be warned not to relax their vigilance for any such reasons. The present relatively satisfactory position is due to the following circumstances :—

1. The quantity and extent of infection are very limited. This is due to the fact that so far only few beasts have actually died of Coast Fever, everything else has been destroyed, the majority at an early stage before infection can be disseminated.

2. The strict supervision maintained by owners and Cattle Inspectors over herds in the vicinity of the infection, and

3. The erection of the fence along the railway; so far this fence has prevented the disease spreading to the northern portion of the Commonage.

ORIGIN OF INFECTION.—The source of infection is, as in the case of the Marandella outbreak, a mystery. The first case which occurred, at least the first known case, was an ox, which had been on the Commonage for about seven months; obviously this animal did not bring the disease with him. Several animals had been introduced to the herd prior to the outbreak, but none of these developed the disease, although some were destroyed as showing a rise of temperature.

The greatest difficulty in tracing infection in a case of this sort is the fact that infected ticks may have been brought in eleven months prior to the outbreak.

BULAWAYO.

GLANDERS.—In March a case of Glanders was discovered in Bulawayo. The affected animal had been about five months in Bulawayo and had passed through the Mallein test on arrival without apparent reaction. All incontacts were at once tested with Mallain, four reacted and were destroyed, Arrangements were made to test all horses and mules in Bulawayo and this work is now proceeding.

The following animals were tested with Malein on entry and found healthy :—

Horses	91
Mules	310
Donkeys...	311

REDWATER.—A virulent outbreak of Redwater occurred amongst some Barotse cattle on the Bulawayo Commonage. and 13 animals out of 32 died, also two local animals.

BELINGWE.

One case of Rabies occurred.

UMTALI.

AFRICAN COAST FEVER.—Fresh Outbreaks : None.

Existing Outbreaks.—The remainder of Bekker's infected herd was slaughtered. The test of Raheen and Quaggas Hock is proceeding satisfactorsly. Two of the test cattle showed a rise of temperature due to Redwater infection.

MELSETTER.

One case of Scab reported.

No contagious disease reported from any of the other districts.

HARTLEY.

A few cattle died from fly disease.

J. M. SINCLAIR,
Chief Veterinary Surgeon.

NOTE.—On May 28th African Coast Fever was found on the farm Stamford, nine miles west of Salisbury, and the usual steps taken for its suppression. The deaths were more numerous than at Gletwyn, and the infection evidently general. Up to May 31st sixteen animals had died, and eleven had been destroyed.

Agricultural Reports.

FEBRUARY AND MARCH, 1910.

MASHONALAND.—Crops in part were injured by dry weather in the early part of the year, but recovered completely later on and towards harvest time, now the prospects are everywhere good, and in parts excellent, except perhaps as regards native grain in the extreme north-eastern limits of the M'Toko District, in the Wedza Reserve, and mealies in Gutu. In some parts second sowings had to be resorted to, late crops resulting, which may be injured by early frosts, but otherwise a good harvest is assured.

Farmers are having to rely more and more on northern labour, and find it on the whole satisfactory, although it is an undoubted drawback that the boys have to return over a thousand miles to their own country after the end of a year, even though desirous of remaining, and have to be replaced by raw boys again. Everywhere stock is thriving, veld is abundant, and the increase satisfactory. Diseases of animals are dealt with separately.

No locusts have been seen in the period under report except in the M'Toko District, where a few swarms of voetgangers were found and destroyed.

From Mazoe it is reported that fewer farmers are growing potatoes this year than hitherto, as many had no sale for their last season's crop. This is particularly regrettable in view of the report of the Scurvy Commission, which emphasises the necessity of vegetable food on the mines, particularly of potatoes. It must be confessed that the situation as regards the supply and market for vegetables leaves much to be desired. The difficulty appears to be in bringing consumers and producers together, and establishing a steady market on which farmers could rely, and to fix prices fair to both sides. The population is too sparse, and the mines too far asunder to meet the case by public markets. The difficulty might perhaps be overcome by means of co-

operation, a group of farmers uniting through the medium of a Farmers' Association or specially formed co-operative society, to supply mines at a fixed price under contract with its requirements during a specific period. With an assured market, crops could be grown to supply vegetable food of one sort or another throughout the year.

As in previous years, again now the Inyanya Estates have demonstrated the potentialities of that part of the country for apple growing. No less than thirteen tons of apples have been sent to the market off three acres of land, and this does not exhaust the crop. That the quality of the fruit is all that is to be desired is borne out by the fact that the silver Banksian medal has again been awarded to Mr. Wienholt by the Royal Horticultural Society for apples exhibited in London in April.

The possibilities of fruit growing in Rhodesia scarcely receive that attention which they deserve, possibly owing to the peculiarity that different parts of the country are so very different in respect of the sort of fruit most suitable to them, citrous or deciduous, temperate or tropic. But that good fruit of many kinds can be grown is now proved beyond all question.

MATABELELAND.—Throughout Matabeleland the prospects of harvest are also good, though it is just possible that early frosts may injure late crops sown on land where the first attempt, owing to the dry spring, had failed. Things promise especially well in Umzingwani, Selukwe, and Gwelo, while an average crop throughout may be anticipated. Considering the gloomy forecast on account of the interruption of the early rains, there has been a most remarkable recovery, and there is no reason to fear any serious shortage. In certain parts, such as Tuli, it is stated that the fact that there is still much grain over in the native granaries from the abundant crops last year has led to diminished areas being sown this season, but what there is looks well.

The condition of the veld is excellent, but in parts, owing to the nature of the rains, the drinking pools may dry out earlier than usual, necessitating shifting of stock where

adequate storage facilities had been provided.

The prices of cattle remain high, and it is remarkable that, although it is customary to decry "improved" stock as tender and unthrifty, the prices realised for stock containing much Friesland, Shorthorn, Devon, or other imported blood, are several times greater than that of native or unimproved stock. Pure bred bulls are in increasing demand, and a steady stream of cattle and sheep for breeding purposes continues to come in from the south, in spite of the presence of disease.

The prices of poultry and eggs also continue high, excessively so when compared to the cost of production, although the price, of course, is not regulated by that consideration but rather by the small supply and the growing demand.

In respect to both provinces, the inflow of settlers, agricultural and other, has become a very noticeable feature, and one which must exert a very material effect, first on the prices of land, stock, and produce, and in time on the quantities of these and on our commercial conditions.

All crops are reported good, and it is gratifying to find in returns furnished from different sources, mention of a larger variety of crops than formerly, when mealies and sometimes wheat and oats seemed to be the only crops of any account. Now, one hears often of farmers going in on a large scale for both foreign and native crops, millets, tobacco, potatoes, onions, ground-beans, velvet beans, pumpkins, marrows, buckwheat, linseed, Kaffir corn, etc.

Compared to previous years, there has been a very decided increase in the amount of veld grass cut for hay this season in all parts of the country, a sound practice which will, no doubt, continue to increase as the difference in condition is seen between cattle so fed compared to those left to starve on the bare veld in the late winter. Such hay is not only being cut for sale, a procedure as exhaustive as veld burning, but is meant for consumption on the farm, which is calculated not only to maintain but to increase the fertility of the soil.

Departmental Notices.

CHEMICAL ANALYSIS OF AGRICULTURAL PRODUCTS.

Arrangements have been made for the chemical examination of soils, limestones, grain, and other produce, oil-seeds, cream, milk, water, fertilisers, etc., on behalf of farmers and others by the Chemist attached to the Department of Agriculture. Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analysis, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, soils, crops, processes and kindred matters, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, etc.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

SAMPLES SENT TO THE DEPARTMENT OF AGRICULTURE.

Parcels are constantly being received for one purpose or another addressed to this Department, very often without any indication of where they from or why they were sent,

and it is difficult in such cases to trace the sender.

It is earnestly requested that farmers and others will mark distinctly on the packages their names and addresses so as to enable their requirements tobe attended to without delay.

MULBERRY CUTTINGS.

Mulberry Cuttings, f.o.r. Salisbury, 5/- per 100. Apply, to the Agriculturist.

TOBACCO SEED.

All enquiries for tobacco seed should in future be addressed to The Manager, Rhodesia Tobacco Warehouse, at Salisbury or Bulawayo.

TOBACCO SEED BED COVERING.

A large supply of calico for covering tobacco seed is now available. It can be obtained from the Anglo-African Trading Company, at Salisbury, Bulawayo and Gwelo.

Price, 2½d. per square yard.

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of

Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem leaves, flowers, and, where possible, fruit. Any particulars regarding the habits of the plant, will be welcomed, and in return the Department will supply all available information regarding the plants.

BOTANICAL SPECIMENS FOR IDENTIFICATION.

In all cases where a botanical identification is required it is of the utmost importance that the specimens reach this office in a thoroughly dry condition, free from mildew and intact, that is not broken in pieces. Whenever possible specimens should comprise main stem or small branch, leaves flowers, seed vessels and roots and bulbs, though these need not necessarily be on the same plant.

The colour of the flowers and the general form of the plant should be preserved by pressing and drying between two sheets of blotting paper or newspaper. Ordinary plants not excessively succulent can be dried sufficiently in three days, provided the drying papers are changed every day. A moderately light weight should be placed on the dryers in order to press the specimens flat.

Correspondents are asked to supply the following particulars as far as possible.

(a) Height and general appearance of plant or tree.
(b) Class of soil found on.
(c) Locality and altitude.
(d) Supposed use or properties.

It is advised that specimens be packed between two sheets of cardboard or thin wood, since in this way they will travel long distances without fear of injury.

DESTRUCTION OF WILD CARNIVORA, ETC.

It is hereby notified for public information that the rewards for the destruction of wild carnivora, etc., will be paid only on the scale and conditions herein set forth:

2. Rewards will be paid as follows:—

For each Lion	£3	0	0
„ Leopard	£1	0	0
„ Cheetah	£1	0	0
„ Wild Dog	£0	10	0
„ Crocodile, of not less than 3ft. in length	£0	10	0

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, and to natives by the Native Commissioner of the district, within three months of the date upon which the animal is killed, on a prescribed declaration form.

4. In proof of destruction, applicants for rewards will be required to produce and surrender, in the case of the Lion, Leopard or Cheetah, the skin with the tail not severed, and in the case of the Crocodile or Wild Dog, the unskinned head.

5. The skins and heads of animals for which rewards have been paid shall be the property of the Government, and shall be disposed of in such manner as may be decided on.

PURCHASE OF STUD STOCK BY GOVERNMENT ON BEHALF OF FARMERS.

Arrangements have been made whereby farmers may purchase pure bred stock through the Department of Agriculture.

Besides securing the benefit of the most competent judges to select the animals, whether in South Africa, England or Europe, purchasers are enableled to make payments by instalments spread over a period of one year.

For full particulars application should be addressed to the Director of Agriculture, Salisbury.

LOANS FOR FENCING PURPOSES.

The B.S.A. Company is prepared to advance funds to any owner of a farm beneficially occupied by a white person, to provide fencing material, on the following conditions:

1. The full cost of the material at nearest station or siding will be advanced, in no case exceeding the sum of £200.
2. Payment shall be made in ten equal annual instalments, or less if the applicant desires, together with interest at 5 per cent. per annum, payable in July, but no repayment will be called for within one year of granting the loan.
3. The applicant will be required to furnish personal security to the satisfaction of the Board, or to pass a first mortgage bond over his farm as security for the loan.

4. The loan only applies to fences erected on the boundary of properties, not to internal fencing.

The loan will be made on completion of fence, and subject to inspection by a representative of the company.

The fence may be erected to any pattern approved by the Board, but for guidance the following minimum requirements will normally be insisted upon :—

Straining posts not further than 440 yards apart; standards not farther than 45 feet apart; droppers or lacing not further than four yards apart; if no droppers are used standards should not be more than 20 feet apart. If wooden strainers, standards or droppers are proposed to be used, the kind is to be specified.

Applications stating the situation and mileage, and furnishing specifications of fence proposed to be erected, and accompanied by firm and detailed quotations for the material required and cost at nearest station, must be addressed in the first instance to the Director of Agriculture, Salisbury.

Preference will be given to farmers in areas which have adopted Part I. of the "Fencing Ordinance, 1904," but all applications will be considered.

Farmers are invited to submit applications for the consideration of the Fencing Board to the Director of Agriculture, Salisbury.

DEPARTMENTAL BULLETINS.

The following Bulletins on special subjects, consisting mainly of reprints of articles which have appeared in the Rhodesian Agricultural Journal, are available for distribution free of charge to applicants in Rhodesia :—

African Coast Fever, by Ll. E. W. Bevan, M.R.C.V.S.
Terms of Analysis of Agricultural Products, Soils, Water, etc., (compiled).
Bots in Equines, by R. Ferguson Stirling, M.R.C.V.S.
Broomcorn, by H. Godfrey Mundy.
Cotton Cultivation, by J. L. Stinson.
"Foul Brood" in Bees, by Rupert W. Jack, F.E.S.
Fencing Ordinance, 1904, (compiled).
Farm Science, by J. E. Wing and others.
Government Aid in Fencing, (compiled).

The Ground-nut or Pea-nut, by H. Godfrey Mundy.

Interim Report on the Animal Trypanosomiases of Southern Rhodesia, by Ll. W. E. Bevan, M.R.C.V.S.

Importation of Plants, etc., Regulations, by Rupert W. Jack, F.E.S.

Maize Growing, by H. Godfrey Mundy.

Malaria, by A. M. Fleming, C.M.G., M.B., F.R.C.S. (Ed.), D.Ph. (Camb.).

Prevention and Treatment of Blackwater Fever, by A. M. Fleming, C.M.G., M.B., F.R.C.S. (Ed.), D.Ph. (Camb.).

The Possibilities of Rhodesia as a Citrus Growing Country, by R. Mellwaine, M.A., L.L.B.

The Potato Tuber Moth, by Rupert W. Jack, F.E.S.

Special Rates for the Benefit of the Farming Community in Southern Rhodesia, (compiled).

Tobacco, by G. M. Odlum.

The Tsetse Fly, by Ll. E. W. Bevan, M.R.C.V.S.

The Time and How to Find it, by Rev. Father Goetz, S.J.

Winter Feeding of Farm Stock, by H. Godfrey Mundy.

Wireworm or Hairworm in Melsetter District, by E. M. Jarvis, M.R.C.V.S.

Flax, Linum usitatissimum, by C. E. F. Allen.

Brief Notes on Blood Sucking Flies, by R. W. Jack, F.E.S.

Accidents to Calves after Calving, by J. M. Sinclair, M.R.C.V.S.

Ensilage, by H. Godfrey Mundy.

The Conservation of Kraal Manure, by H. Godfrey Mundy

Notes on Trypanosomes of the Dimorphon Group, by L. E. W. Bevan, M.R.C.V.S. and M. F. MacGregor-Sharpe.

Preservation of Butter.

DIPPING TANKS: GRANTS IN AID.

The Government will make grants in aid for the purpose of constructing dipping tanks, to approved applicants.

Grants will only be made after the tank has been inspected and approved by the Director of Agriculture or an official deputed by him.

Grants will be made on the £ for £ principle, but the amount paid in any case will not exceed £50.

Applications should be made to the Director of Agriculture from whom further particulars can be obtained.

Editorial Notices.

The "Journal" is issued bi-monthly, and the subscription is 5s. per annum, payable in advance. All communications relating thereto should be addressed to the Director of Agriculture, Agricultural Department, Salisbury, and if an answer is required in the pages of the "Journal," should reach this office not later than the 15th of the month preceding publication. Subscribers are requested to notify immediately the non-delivery of the "Journal."

TO ADVERTISERS.—Application for space in the "Rhodesian Agricultural Journal," should be addressed to the Director of Agriculture, Salisbury. The rates are as follows, per issue :—

Position.	Whole Page. £ s. d.	Half Page. £ s. d.	Quarter Page. £ s. d.
Inner Pages	2 0 0	1 5 0	0 15 0
Outer Cover (back) ...	4 0 0	—	—
Inner Covers (back and front) and page facing Contents	3 0 0	1 15 0	1 0 0

A discount of 10 per cent. will be allowed for standing or consecutive advertisements running through six issues. Remittances, and electros where desired, should accompany orders The right is reserved to discontinue the insertion of standing or consecutive advertisements should payment beyond the second issue be delayed.

The right of approval of all advertisements by the Director of Agriculture is reserved and his decision as to the acceptance or rejection is final.

An additional charge may be made for advertisements printed in special type, equal to any additional charges made by the printers for setting up same

Advertisements will be accepted from bona fide farmers wishing to effect sale, purchase or exchange of produce, live stock, or farm implements, at a minimum charge of 2s. 6d. per insertion of 20 words. Extra words will be charged for at the rate of 1s. for every 10 words.

Government Notices.

No. 223 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 30th September, 1909.

IT is hereby notified for public information that His Honour the Acting Administrator has been pleased to approve of the temporary appointment of James Woodin, Esquire, to be examiner of Stock for the purpose of granting permits for the introduction of Livestock into Southern Rhodesia.

By command of His Honour the Acting Administrator.

P. D. L. FYNN,
For Treasurer.

No. 211 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 16th September, 1909.

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—

Grass	Straw
Hay	Lucerne Hay
Forage	Green Lucerne
Sugar Cane	

or any other bedding or fodder plant.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,
For Treasurer.

No. 295 of 1908.
Department of Agriculture,
Administrator's Office,
Salisbury, 1st October, 1908.

IMPORTATION OF STOCK.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 8, of the 19th day of January, 1905, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries enumerated is prohibited, owing to the existence or supposed ex-

istence of destructive diseases affecting the said animals in the said countries:—

(1) All animals from the island of Mauritius.

(2) All animals from German South-West Africa and all animals except donkeys from German East Africa.

(3) Pigs from the colonies of the Cape of Good Hope, Transvaal and the Orange River Colony, the Bechuanaland Protectorate, the Tati Concession, and other countries in which swine fever exists, subject, however, to the exceptions contained in the proviso to this section.

(4) Dogs from the territories of North-Eastern and North-Western Rhodesia and Portuguese East Africa; provided, however, that dogs from countries from which importation is permitted may be introduced through the port of Beira and brought direct into this Territory.

(5) Sheep and goats from (a) the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingswilliamstown, Komgha, Peddie, Somerset East, Stockenstroom, Uitenhage, and Victoria East, in the Cape Colony; (b) the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterburg, and Zoutpansberg, in the Transvaal; (c) Swaziland; (d) Portuguese Territory; (e) places north of the Zambesi River.

Provided, however, that the Controller of Stock may at his discretion permit the importation of pigs under six months of age for breeding purposes from the places mentioned in sub-section (3), and sheep and goats from the places mentioned in sub-section (5) hereof, on production of a certificate of a duly authorised Government veterinary officer that such animals are free from disease, have not been in contact with diseased animals, and have not come from an area where destructive disease has existed for twelve months previously.

2. The importation of organic manures, except guano, is strictly prohibited, and the importation of bone meal and bones required for fertilising or feeding purposes will only be permitted when accompanied by the certificate of a responsible and competent person that they have been thoroughly disinfected by treatment by superheated steam or other approved method. Any such manures, bone meal or bones introduced into Southern Rhodesia contrary to this regulation shall be liable to immediate destruction.

3. The areas set out in Schedule "A," and such further areas as may be added to the said schedule, shall be used in connection with pasture lands of the places to which they relate for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever.

4. The appointment of the areas set out in Schedule "B" hereto for the depasturing and quarantining of animals for slaughter in connection with the places therein mentioned is confirmed.

5. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel and the period for which the permit shall be in force. In cases where it may appear necessary or desirable, the person to whom any such permit is issued may be required to cause the animals

referred to therein to be dipped before being moved.

6. The introduction of sheep and goats against which no prohibition exists may be permitted by rail, subject to the following provisions:—

(1) Plumtree shall be regarded as the port of entry.
(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto; provided, however, the Controller of Stock may allow the introduction of well-bred sheep or goats intended for sale or stud purposes without being previously dipped.
(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival; provided, however, that animals intended for immediate slaughter shall be exempt from dipping if marked with a distinctive brand on the back.

7. The introduction of sheep and goats against which no prohibition exists may be permitted by road, subject to the following provisions:—

(1) M'Lala Drift and Fort Tuli shall be regarded as ports of entry.
(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto.
(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival.

8. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Officer at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detrained at any intermediate station without the written authority of a Government Veterinary Surgeon.

9. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the police camp nearest to the place where such entry is made, and the officer in charge of such police camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

10. All horses, mules and donkeys upon entering Southern Rhodesia shall be tested with mallein, and the owner or person in charge of such animals shall, in all respects, carry out the lawful directions of the Inspector while such animals are being tested; provided that this regulation shall not apply to animals in transit by railway through Southern Rhodesia and which are not detrained en route.

11. The Inspector may direct the detention of any animal, and its isolation for the purposes of such examinations and tests as may be deemed expedient during which period of isolation or detention it shall be maintained and tended at the expense of the owner. If in the case of any such animal a second injection of mallein, applied at an interval of not less than ten days, is followed by a reaction indicative of the existence of glanders, such animal shall be forthwith destroyed.

12. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border to and from Portuguese East Africa, may be allowed so to cross on such terms as to registration, branding, testing and other conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

13. All horses, mules and donkeys depastured on the town lands of Melsetter and Umtali or on any public outspan adjoining such lands, and within the following area known as the Penhalonga, Imbesa and Samba Valleys, as bounded by the Umtali Waterfall Range on the north, the divide following beacons 18, 24 and 27 on the east, the Christmas Pass Range on the south, and the Palmyran Range on the west, in the district of Umtali, shall be dipped every fourteen days, by or at

the expense of the owner or person in charge of such animals, unless the local Veterinary Officer shall see fit to dispense with such dipping.

14. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings, fodder, excreta or other matter or thing which may be reasonably calculated to convey such infection.

15. Any person contravening the provisions of these regulations, or the instructions or directions given in terms of these regulations, shall be liable in respect of each offence to a penalty not exceeding twenty pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

W. H. MILTON.
Administrator.

By command of His Honour the Administrator.

F. J. NEWTON,
Treasurer.

SCHEDULE "A."

Areas on or near pasture land used in connection with townships set apart for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever:—

1. For the township of Salisbury and its neighbourhood, the Government Farm Makabusi, as defined in Government Notice No. 13 of 1898, namely, about six miles from Salisbury on the Old Charter Road, and bounded on the north, north-east and west by the farm "Willowdale," and on the south and south-east by the Makabusi River.

2. For the township of Umtali, a triangular piece of land situate to the north-east of the township, being that portion of the farm "Birkley" which falls in British territory.

3. For the township of Melsetter, a piece of land included within those lines bounding the pasture lands laid out around the township, which are in common with the outspan in the west, Sawerombi on the north, and Westfield on the north-east, bounded further on the south by a line drawn from the common beacon of Westfield and Lindley to the common beacon of Fairfield and outspan.

4. For the township of Enkeldoorn, a piece of land about 2½ miles due west of the township and bounded as follows: From a point about 400 yards above the junction of a stream running south of Enkeldoorn township with streams running west from the Police Camp; thence along the first stream to the junction aforementioned; thence along a valley running due south from the said junction to a point about 700 yards distant; thence in a north-westerly direction to a point on the top of a rise about 1,200 yards distant; thence in a straight line to the first-mentioned point.

5. For the township of Victoria, a strip of land half-a-mile in width lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

6. For the township of Gwelo, a triangular piece of ground within the reserved lands around Gwelo. It is bounded south by the Watershed block along its boundary running from its joint beacon with Kanuck westwards to another beacon 1,518 Cape roods distant, bounded north-westwards by a line about 1,350 roods in length to the Inoculation Station, and bounded north-eastwards by a line from the first mentioned beacon to the Inoculation Station, and about 1,400 roods in length. This piece of ground is called the Inoculation Camp.

7. For the township of Bulawayo that portion of the commonage bounded on the west and north by the Bulawayo-Mafeking and Gwelo railway lines, on the east by the road known as "Hillside Avenue," on the south to the limits of the commonage and Hillside, known as "Napier's Lease," approximately 4,750 acres in extent.

SCHEDULE "B."

Areas set apart for depasturing and quarantining of animals for slaughter:—

SALISBURY.—Description of the area.—A piece of land, 400 acres in extent, situated on the Makabusi River, below Maggio's plot, towards the southern boundary of the Salisbury commonage.

BULAWAYO.—Description of the area.—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi Road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres, more or less.

GWELO.—Description of the area.—Starting from a point where the Ingwenia Road crosses the railway, along this road past the sanitary stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the commonage beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins Main Street extension along this to the railway line, and down this to the starting point.

UMTALI.—Description of the area.—Starting from a point at the south-east corner of the farm "Devonshire" and south-west of "Waterfall," up the stream to where it is joined by the stream commonly known as Rifle-butt Spruit, and up this spruit to a point 300 feet below Paulington Bridge. Thence almost due north on the west of Penhalonga Road to the sanitary pits and from the sanitary pits to the Cemetery, thence due west to the "Devonshire" line and along this line south to south-west corner beacon of "Waterfall."

SELUKWE.—Description of the area.—A piece of fenced land, in extent about 300 acres, situated on the farm "Sebanga" and adjacent to the township of Selukwe.

PENHALONGA.—Description of the area.—A piece of land bounded as follows:—To the northward by a line starting from the south-east beacon of the hotel stand to the south-west and south-east beacons of Crawford's butchery. To the eastward from the south-east beacon of Crawford's butchery to the northern boundary of the Penhalonga Proprietary Mines' ground. To the southward along the northern boundary line of the Pennaionga Proprietary Mines' ground. To the westward from the north-west beacon of the Penhalonga Proprietary Mines' ground to the south-east beacon of the hotel stand.

VICTORIA.—Description of the area.—A strip of land, half-a-mile in width, lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

SCHEDULE "C."

I, ...
residing at
in the district of in the
.....Colony, do solemnly and sincerely declare that the animals enumerated below are free from any contagious disease, including scab, and have not been in contact with any infected animals within six months from date hereof, and that to the best of my knowledge and belief such animals in travelling to* Station will not come in contact with any animals amongst which scab or any other contagious disease has existed during that period; further, that

such animals were thoroughly disinfected by dipping on..... and will enter Southern Rhodesia within ten days of having been dipped.

And I make this solemn declaration conscientiously believing the same to be true.

Declared to at on this day of before me.

.....

Resident Magistrate, Government Veterinary Surgeon, Scab Inspector, or Police Officer of district from which animals are being sent.

Number and general description of animals being sent

.....

Owner's name and Address

.....

Place in Southern Rhodesia to which animals are being sent

.....

* Station within Colony of origin.

CERTIFICATE ISSUED UNDER PROVISIONS OF SECTION I, GOVERNMENT NOTICE No. 295 OF 1908.

This is to certify that the animals enumerated below are, in my opinion, free from any destructive disease, including scab, and to the best of my knowledge and belief have not been in contact with any infected animals nor come from,or through, a locality where any such disease is known to exist or has existed for twelve months from date hereof.

Date.....

Place.....

.....

Signature of Government Veterinary Surgeon.

Number and general description of animals.....Pigs, ...Sheep, ...Goats.

Place from which animals are to be sent.....

.....

Owner's Name and Address

.....

Place in Southern Rhodesia to which it is desired to send the animals

.....

No. 110 of 1908.

Department ofAgriculture,

Administrator's Office,

Salisbury, 16th April, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

(1) A permit shall be required from the Chief Inspector which may

contain such conditions as shall from time to time appear expedient.

(2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."

(3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.

(4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.

(5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcases thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.

(6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—

(1) Importation shall be through and direct from the Coast Ports of the Cape Colonies, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.

(2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.

4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcases, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

ANNEXURE "A."
APPLICATION FOR CATTLE IMPORTATION PERMIT.

GOVERNMENT NOTICE No. 110 OF 1908, SECTION 1 (2).

1. Applicant's Name and Address.....
2. Number and Class of cattle to be imported.....
3. Area or Farm and District where Cattle are at present located.....
.....
4. Area or Farm and District to which Cattle are to be moved.....
.....

Applicant's Signature.....

Date
Application
Permit No.

No. 60 of 1909.

Department of Agriculture
Administrator's Office,
Salisbury, 1st April, 1909.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal Government Notice No. 124 of 1908, and do hereby declare and make known that, notwithstanding anything to the contrary elsewhere provided, the importation of cattle for bona fide slaughter purposes may be permitted into the Umtali district from the adjoining Portuguese territory, under the following terms and conditions:—

(1) The importation and disposal of cattle, introduced in terms of these regulations, shall be under the absolute control and direction of the local Veterinary Surgeon or other duly appointed officer, and shall be regulated by the requirements of consumption.

(2) The importation shall be by rail only, and all cattle shall be detrucked at the slaughter enclosure and immediately confined therein.

(3) All cattle admitted to the slaughter area shall be immediately branded with the letters "V.D."

(4) All cattle admitted to the slaughter area shall be slaughtered within ten days of their admission, and under no pretext whatever shall cattle so admitted be permitted to leave the said area alive; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area or in possession of any person, may be destroyed under an order of the Chief Inspectoir or Controller of Stock.

(5) No meat shall be removed from the said area without special permission unless it is entirely free from skin and ears.

(6) The hides of animals slaughtered in the said enclosure shall be immediately immersed in an approved insecticide for a period of not less than twelve hours, and shall not be removed from the said enclosure unless accompanied by a certificate signed by a Veterinary Surgeon that they have been satisfactorily disinfected and dried.

(7) Any person contravening the provisions of these regulations or the instructions or directions of the local Veterinary Surgeon or other duly authorised official, given in terms of these regulations, shall be liable, in respect of each offence, to a penalty not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, unless where more severe or heavier penalties have, by the aforesaid Ordinance, been expressly provided.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 268 of 1907.
Department of Agriculture,
The Treasury,
Salisbury, 26th December, 1907.

REMOVAL OF CATTLE FOR SALE.

NOTWITHSTANDING anything to the contrary contained in the Regulations published under Government Notices Nos. 188 of 1906 and 217 of 1907, I, under and by virtue of the powers conferred upon me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide as follows:—

1. The assembly of cattle for purposes of sale by auction or otherwise may be permitted as such places and under such conditions as the Chief Inspector may from time to time prescribe.

2. The movement of cattle into the province of Mashonaland and the fiscal division of Gwelo from other places in Southern Rhodesia may be permitted under such conditions as the Chief Inspector may from time to time prescribe.

3. The granting of permits for the purposes of Sections 1 and 2 hereof and the nature of the conditions to be attached thereto shall be at the absolute discretion of the Chief Inspector.

4. Any person contravening the provisions of these Regulations or the conditions attached to permits issued thereunder shall be liable to a fine not exceeding £20, or, in dafault of payment, to imprisonment with or without hard labour for a period not exceeding three months.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 216 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 23rd September, 1909.

MOVEMENT OF CATTLE, PROVINCE OF MASHONALAND AND DIVISION OF GWELO.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices No 217 of 1907, Nos. 114 and 170 of 1908 and No. 199 of 1909, and so much of any

other Regulation as may be repugnant to or inconsistent with the provisions of these Regulations, and declare that the following shall be of full force and effect in lieu, from date of publication, within the Province of Mashonaland and the Fiscal Division of Gwelo, as defined by the "Southern Rhodesia Boundary Regulations Amendment Regulations, 1898," which areas are hereby declared to be infected with a destructive disease:—

1. The movement of cattle within the said areas is prohibited save and except—

(*a*) on permission granted by an inspector or sub-inspector or other officer authorised by the Administrator;

(*b*) within the boundaries of any single farm where such cattle are depastured;

(*c*) within any area enclosed by a substantial fence;

(*d*) within the boundaries of the various commonages, town lands or grazing ground common to any mining camp;

(*e*) for cattle the property of natives within a radius of four miles of their owners' kraal situate within the boundaries of any native location or reserve; the site of such kraal shall be deemed to be the place where it is situated at the date of publication hereof, and as is hereinafter further provided.

2. The movement of cattle for *bona fide* farming, breeding, mining, dairying, grazing and slaughter purposes may be permitted under the written authority of an official thereto duly authorised, subject to the following terms and conditions—

(*a*) the written permission of owners, occupiers or managers of all occupied lands, and, in the case of native reserves, of the Native Commissioner of the district over which cattle shall pass, is obtained; provided that, in the event of such owners, occupiers, managers or Native Commisssoners refusing to grant such permission, the Controller of Stock may direct the issue of a permit of removal if satisfied that the necessary permission is withheld without good and sufficient cause; and provided further that such permission shall not be required in respect of any movement of cattle within native districts or group of native districts as defined under Section 3 hereof, or in such districts or group of districts as may hereafter be defined, or in respect of movements authorised in terms of subsection (*c*) of the said Section;

(*b*) that such cattle shall, before being moved, be thoroughly dipped or sprayed to the satisfaction of the officer issuing the permit, and, if intended for slaughter, shall where possible be branded, under the supervision of the officer issuing the permit, with the letters "V.D." on the near hind quarter;

(*c*) that cattle intended for slaughter shall, on arrival at destination subject to the terms of clause (*d*) hereof, be immediately taken to the prescribed quarantine area and there be quarantined and confined, and, where not branded in terms of clause (*b*) hereof, be similarly branded under the supervision of a duly authorised officer

(*d*) that all cattle intended for slaughter brought to their destination and not dipped or sprayed in terms of clause (*b*) hereof, shall be immediately thoroughly dipped or sprayed

(*e*) that all cattle admitted to the quarantine area shall be slaughtered within twenty-one days of admission, and only be permitted to leave the area for the purpose of being driven to the abattoir for slaughter.

and all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found outside the said area, at large or in possession of any person may be destroyed under an order of the Chief Inspector or Controller of Stock;

(*f*) that intermediate depots, or concentration camps, for slaughter stock may be allowed at centres approved of by the Chief Inspector of Cattle, provided that no such camp shall be situated within a less radius than five miles of any commonage, town lands, or grazing ground common to any mining camp, railway station or siding.

3. The movement of working cattle may be permitted under the written authority of an official thereto duly authorised—

(*a*) within the borders of the following native districts:—Gwelo, Hartley Lomagundi, Marandellas, Melsetter, Selukwe and Umtali;

(*b*) within the following groups of native districts:—
(1) Charter and Chilimanzi;
(2) Mtoko, Mrewa, Makoni and Inyanga;
(3) Goromonzi Mazoe and Darwin;
(4) Chilimanzi, Victoria, Ndanga and Chibi;

(*c*) between the Makondo Copper Mine in the Ndanga district and Karombe's Kraal in the Umtali district along the west bank of the Sabi river;

Provided that all cattle working under this section should be thoroughly dipped or sprayed every fourteen days, and provided that movements will be permitted for such periods as the Controller of Stock may in his discretion and on the advice of the Chief Inspector deem expedient, and that such permission may at any time be withdrawn or withheld without notice.

4. All applications for the removal of cattle from one native district to another shall be submitted for the approval of the Cattle Inspectors of the districts to and through which movements are made. All permits granted under the provisions of these regulations shall specify the number and brands of cattle, route to be traversed and time to be allowed for each journey, and such other conditions as it may be deemed expedient to prescribe; and all such permits shall be in the possession of the person travelling with or in charge of the cattle. Any breach of such conditions shall be deemed a contravention of the regulations in terms of section 9 hereof.

5. All veld-fed animals within the limits of the various commonages or town lands, or other centres where there is a common grazing ground and upon which public dipping tanks have been established, shall be dipped therein at least once every fourteen days; provided that the Controller of Stock may, on the advice of the Chief Inspector, direct the temporary suspension of this regulation for such reasons as he may regard as sufficient.

6. The following charges shall be paid at the time of dipping by the owner of the cattle or other animals required to be dipped under these regulations in respect of any dipping done at the public dipping tank:—

For horned cattle, 6 months and over	3d. per head.
For horses and mules	3d. „
For calves (under 6 months) and donkeys ...	2d. „
For small stock	½d. „

with a minimum charge of 6d. ... ny number of animals not aggregating such fee under the above tariff.

7. Any permit granted may be summarily suspended by any Inspector or Sub-Inspector or member of a police force finding cattle travelling under the same to be infested with ticks, and such officer may detain such cattle until such time as the animals have been cleansed to his satisfaction.

Any dipping or spraying required to be done under these regulations shall be carried out with an approved tick-destroying agent by the owner of the animals; provided that the Inspector or Sub-Inspector may at his discretion carry out such treatment at the entire cost of the owner of such animals.

The Controller of Stock may, on the advice of the Chief Inspector, direct the temporary suspension of dipping and spraying for such reasons as he may regard as sufficient.

8. Whenever the owner, occupier or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying or dipping or any other method permitted by these or any other regulations, the Cattle inspector may order such natives or others as have cattle on the same farm to cleanse such cattle or any others before permitting them to enter or pass over such area, and the Native Commissioner of the district in which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle, at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

9. Any person contravening any of the provisions of these regulations shall, upon conviction, be liable, in respect of each offence, to the fines and punishment prescribed by the Ordinance; and, in the case where no special punishment is provided, to a fine not exceeding £20 or, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding three months unless the penalty is sooner paid.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council.

P. D. L. FYNN,
For Treasurer.

No. 356 of 1908.

Department of Agriculture,
Administrator's Office,
November, 1908.

MOVEMENT OF CATTLE INTO MATABELELAND.

NOTWITHSTANDING anything to the contrary contained in the Regulations published under Government Notices Nos. 188 of 1906 and 217 of 1907, I, under and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide as follows:—

1. The movement of cattle from the Province of Mashonaland into the Province of Matabeleland and from the Fiscal Division of Gwelo into other parts of Matabeleland may be permitted under such conditions as the Chief Inspector may from time to time prescribe, provided, however, that such movement shall not be permitted in respect of cattle imported from the country to the North of the Zambesi River until they shall have first remained for a period of at least twelve months in the Province of Mashonaland or the Fiscal Division of Gwelo.

2. The granting of permits for the purposes hereof, and the nature of the conditions to be attached thereto, shall be at the absolute discretion of the Chief Inspector.

3. Any person contravening the provisions of these regulations, or the conditions attached to permits issued thereunder, shall be liable to a

fine not exceeding £20, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No 39 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 11th March, 1909.

MOVEMENT OF CATTLE, PROVINCE OF MATABELELAND.

1. UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 188 of 1906 and 216 of 1907, and declare the following to be of full force and effect in lieu thereof within the province of Matabeleland, exclusive of the district of Gwelo, as described and defined by section 4 (c) of the Southern Rhodesian Boundary Regulations Amendment Regulations, 1898, which is hereby declared to be an area infected with a destructive disease, and is hereinafter called the said area.

2. The movement of all cattle within the said area is prohibited save and except

(a) on permission granted by the local Cattle Inspector;

(b) within the boundaries of any single farm where such cattle are depastured;

(c) within an area of land enclosed by a substantial fence;

(d) within a radius of four miles from any native kraal situate within the boundaries of any native location or reserve, and as hereinafter further provided.

3. The movement of cattle for slaughter, grazing, bona fide farming, mining or breeding purposes, or for private milk supplies, shall be permitted under the written authority of an official thereto duly authorised, subject to the following terms and conditions:—

(a) that the written permission of owners, occupiers, or managers of all occupied land, and in the case of native reserves, of the Native Commissioner of the district over which such cattle shall pass, is first obtained; provided that in the event of such owners, occupiers, managers or Native Commissioners refusing to grant permission, the Controller of Stock may direct the issue of a permit of removal, if satisfied that the necessary permission is withheld without good and sufficient cause;

(b) that such cattle shall, before being moved, be thoroughly disinfected by dipping or spraying, to the satisfaction of the officer issuing the permit, and at the expense of the owner of such stock, and, if intended for slaughter, shall where possible be branded, under the supervision of the officer issuing the permit, with the letters "V.D." on the near side of the neck;

(c) that cattle intended for slaughter, shall, on arrival at destination, subject to the terms of clause (d) hereof, be immediately taken to the prescribed quarantine area and there be quarantined and

confined, and, where not branded in terms of clause (b) hereof, be similarly branded under the supervision of a duly authorised officer;

(d) that all cattle intended for slaughter brought to their destination and not disinfected by dipping or spraying, in terms of clause (b) hereof, shall be immediately taken to the public dipping station and there be thoroughly dipped or sprayed before being taken to the quarantine area;

(e) that all cattle admitted to the quarantine area shall be slaughtered within twenty-one days of the admission, and only be permitted to leave the area for the purpose of being driven to the abattoir for slaughter; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area, or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.

4. The movement of working cattle may be permitted under the following conditions only:—

Within the said area from private farms, mines and trading stations to any centre of consumption, or to or from a railway station or siding, or to and from any other farm under the permit of a duly authorised officer, which permit shall fully set forth the route to be traversed; provided that no permit shall be issued until the person applying for the same shall produce the written consent of owners, occupiers or managers of occupied lands proposed to be traversed, and in the case of native reserves, of the Native Commissioners, and that such cattle, before being moved, be thoroughly disinfected by dipping or spraying at the expense of the owner, and to the satisfaction of the officer issuing the permit; provided, further, that in the event of such consent being unreasonably withheld, the Controller of Stock may direct the issue of a permit.

5. All applications for the removal of cattle from one native district to another shall be submitted for the approval of the Government Veterinary Surgeon at Bulawayo and the Cattle Inspector of the district to which the removal is to be made.

6. All permits granted under the provisions of this notice shall specify the number and brands of cattle, route to be traversed, and time allowed for each journey. Any breach of these or other conditions endorsed on the permit by the issuing officer shall be deemed a contravention of these Regulations, in terms of section 9 hereof.

All veld-fed animals within the limits of the various commonages or townlands, or other centres where there is a common grazing ground and upon which public dipping tanks have been established, shall be dipped therein at least once every fourteen days; provided that the Controller of Stock may, on the advice of the Veterinary Department, direct the temporary suspension of this Regulation, for such reasons as he may regard as sufficient.

8. The following charges shall be paid at the time of dipping by the owner of the cattle or other animals required to be dipped under these Regulations, in respect of any dipping done at a public dipping tank:—

For Cattle (over six months)	3d.	per head.
,, Horses and Mules	3d.	,,
,, Calves (six months and under)	2d.	,,
,, Small Stock	½d.	,,

with a minimum charge of 6d. for any number of animals not aggregating such fee under tariff.

9. Any disinfecting by spraying required to be done under these Regulations shall be carried out with an approved insecticide by the owner of the animals so sprayed; provided that the Inspector may, at his discretion, carry out such disinfection, with the assistance of and at the entire cost of the owners of the animals sprayed, the cost of such disinfection being payable at the time of the spraying.

10. Any person contravening any of the provisions of these Regulations shall, upon conviction, be liable, in respect of each offence, to the fines and punishments prescribed by the Ordinance; and, in the cases where no special punishment is provided, to a fine not exceeding £20; or, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding three months, unless the penalty be sooner paid.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 101 of 1909.
Department of Agriculture,
Administrator's Office,
Salisury, 19th May, 1909.

UNDER and by virtue of the powers in me vested by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare the disease amongst live stock, due to the organism known as Trypanosoma Dimorphon, to be a destructive disease within the meaning of the said Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No 45 of 1909.
Administrator's Office,
Salisbury, 13th March, 1909.

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 156 and 228, of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the

first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcases of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. In the event of any outbreak of rabies occurring, all owners of dogs within fifteen miles of such outbreak, or such other area as may be fixed, shall, on notification by any of the above-mentioned officials, or by Government Notice in the "Gazette," at once place and keep their dogs in a safe enclosure, or chained up, for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash held by the person exercising them.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the

owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON.
Treasurer.

No. 249 of 1908.
The Treasury,
Salisbury, 27th August, 1908.

PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON.
Treasurer.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

(a) Birds and Small Buck.

(b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tasessibe, Waterbuck and Wildebeest.

(c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—

In Mashonaland:
Birds from 1st May to 30th September.
Small Buck from 1st May to 31st October.

In Matabeleland:
Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Secretary for Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Secretary for Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Velt in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 40 of 1909, amended by No. 128 of 1909, withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1910, and transfers from Class "C" to Class "B" Eland, Koodoo, and Zebra so far as that area is concerned. Under Government Notice No. 129 of 1909 game in Class "B" may be shot without a licence in this area.

Game in Class "A" may be hunted in the close season until further notice, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Salisbury, Bulawayo, Umtali and Melsetter; within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the landowner.

No. 128 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 10th June, 1909.

GAME LAW CONSOLIDATION ORDINANCE, 1906.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby declare and make known that the area described in section 1 of Government Notice No. 40 of 1909 shall be extended and include the area bounded as follows:—

From the Railway bridge on the Umfuli River thence north-westwards along the Umfuli River to where it joins the Umniati River, thence south-wards along the Umniati River to where it joins the Umsweswe River, thence eastwards along the Umsweswe River up to the drift at the Lydia Mine, thence along the old road from Lydia Mine to Etna Mine and to Inez Mine, thence northwards along the road from Inez Mine to Hartley, thence in the direction of the Railway bridge to the starting point on the Umfuli River.

F. J. NEWTON,
Acting Administrator.

By command of His Honour the Acting Administrator in Council..

P. D. L. FYNN,
For Treasurer.

No. 108 of 1910.

Department of Agriculture,
Administrator's Office,
Salisbury, 19th May, 1910.

PROTECTION OF GAME ON COMMONAGES.

UNDER and by virtue of the powers conferred upon me by the "Game Law Consolidation Ordinance, 1906," I do hereby declare that up to the 30th day of April, 1911, all game within the limits of the Commonage or Townlands of Bulawayo, and within a radius of two miles of the Magistrate's Court, Gwelo, shall be strictly protected, and shall not be hunted or destroyed.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON.
Treasurer.

No. 391* of 1908.

Department of Agriculture,
Administrator's Office,
Salisbury, 17th December, 1908.

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdrew the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

* Republished with corrections.

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

9. There shall be payable to the Registrar or Deputy Registrar:—

(a) For every separate registration of a brand, 5s.

(b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next in order, according to the following table:—

i. Off Neck or Rump (or Thigh);
ii. Near Shoulder (or Top of Arm);
iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

i. Off Rump (or Thigh);
ii. Near Shoulder (or Top of Arm);
iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

i. On Near Side or Ribs;
ii. Near Rump (or Thigh);
iii. Off Shoulder;
iv. Off Side or Ribs;
v. Off Rump (or Thigh).

(d) In the case of ostriches:—

i. On Near Thigh;
ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette."

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the provisions of this section shall on conviction be liable to a fine not exceeding £5.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

P. D. L. FYNN,
Acting Treasurer.

No. 52 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 25th March, 1909.

CONDITIONS UNDER WHICH GOVERNMENT VETERINARY SURGEON'S SERVICES ARE AVAILABLE TO THE PUBLIC.

1. ON and after 1st April, 1909, the services of Government Veterinary Surgeons will be available to the public, free of charge for the following purposes only:—

(1) Attending and giving professional advice in connection with the following diseases, viz.:—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lung-sickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

(2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

(3) Inoculations against the following diseases:—

Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz.:—

	£	s.	d.
(1) For every professional visit within three miles of his office or residence	0	5	0
(2) For every professional visit beyond such distance plus an additional charge of 2s. 6d per hour whilst engaged in such visits, or £2 2s. a day of 24 hours;	0	10	6
(3) For advice given at the Veterinary Surgeon's office, for each animal, per visit	0	2	6
(4) The following to be charged in addition to visiting fees:—			
a. For every examination as to soundness, each	1	1	0
b. For castration, horses, each	1	1	0
c. ,, bulls ,, ...	0	5	0
d. ,, donkeys ,, ...	0	10	6
e. For parturition cases, mares, each	2	2	0
f. For parturition cases, cows, each	1	1	0
g. For other operations, according to nature, from 5s. to £2 2s.			

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government veterinary surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government veterinary surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the veterinary surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive

in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government veterinary surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government veterinary surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government veterinary surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 281 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 2nd December, 1909.

UNDER and by virtue of the powers vested in me by section 8, sub-section (1) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the removal of the following articles from areas known or suspected to be infected with any destructive disease:—

Skins, hides, green forage, hay of any sort, fodder, bedding, reeds, kraal or stable manure, or any article which may reasonably be supposed to convey infection, or infective insects.

Any person removing articles in contravention of the aforesaid prohibition shall be liable to the penalties on that behalf provided and to have such articles destroyed, in terms of section 5, sub-section (6) (a) of the aforesaid Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

No. 262 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 25th November, 1909.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidated Ordinance, 1904," I do hereby cancel Annexure "B" referred to in sub-section (2) of section 1 of Government Notice 110 of

1908, as amended by Government Notice No. 87 of 1909, and in place thereof do substitute the following, which shall, from date of publication hereof, be the form required to accompany Annexure "A," also referred to in aforementioned sub-section.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.

F. J. NEWTON,
Treasurer.

ANNEXURE "B."

I,.....

residing on the farm

in.....do solemnly and sincerely declare that the..... (numbered in writing) animals also enumerated below have been in my possession since birth, and that lung-sickness, pleuro-pneumonia or other contagious or infectious disease has not existed amongst any of my cattle, nor on my farm, nor among any cattle with which these animals have been in contact within the last four years, and that these animals have never been exposed for sale in any public market or stock fair, nor been in contact with strange cattle, and that to the best of my knowledge and belief such cattle in travelling to Station (*i.e.*, station where cattle are to be trucked) will not come into contact with any animals amongst which lung-sickness or any other contagious or infectious disease has existed during that period.

Number of Animals.....Bulls.....Heifers.....

Breed.....

Seller's Name and Address.....

.....

Purchaser's Name

Place in Southern Rhodesia to which animals are being sent

.....

And I make this solemn declaration conscientiously believing the same to be true.

.....

Declared to at.....on this.....

day of.....before me,

.....

Resident Magistrate for the district of

.....

No. 309 of 1909.

Department of Agriculture,
Administrator's Office,
Salisbury, 30th December, 1909.

IMPORTATION OF PLANTS &c., REGULATIONS.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that the following regulations shall be of force and effect on and after 1st day of March, 1910:—

(1) No person shall introduce into Southern Rhodesia from outside South Africa any consignment of potatoes unless accompanied by a certificate from the consignor stating fully in what country and district of that country the potatoes were grown, and that the disease known as Warty disease or black

scab, caused by the fungus *Chrysophlyctis endobiotica* Schil, is not known to occur on the land on which the potatoes were grown. Any consignment not accompanied by such certificates will be liable to be seized and destroyed.

(2) All consignments of potatoes which are imported from other parts of South Africa or from oversea, if found on inspection to be infested with any pest or disease, other than black scab, will be sorted at the expence of the consignee and the diseased tubers destroyed.

(3) A charge of 6d. per bag or case will be made for sorting.

(4) Should any consignment on arrival be found to be infested with black scab, it will not be sorted but will be totally destroyed.

(5) Any person guilty of a contravention of these Regulations shall be liable to a fine not exceeding £10.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.
F. J. NEWTON,
Treasurer.

No. 263 of 1909.
Department of Agriculture,
Administrator's Office,
Salisbury, 25th November, 1909.

IMPORTATION OF SWINE.

NOTWITHSTANDING the prohibition which exists under section 1 subsection 3 of Government Notice No. 295 of 1908 against the importation of swine from the Colony of the Cape of Good Hope, I, under and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide that swine may be imported from the Cape of Good Hope under a permit issued by the Chief Inspector or Examiner of Stock, and subject to any examination and quarantine on entry that may be necessary, and to such other conditions as may be deemed expedient to attach to such importations.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.
F. J. NEWTON,
Treasurer.

No. 264. of 1909.
Department of Agriculture.
Administrator's Office,
Salisbury, 25th November, 1909.

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of horns and raw hides of cattle from the Bechuanaland Protectorate.

Any horns or hides introduced in contravention of this prohibition shall be confiscated and destroyed.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.
F. J. NEWTON,
Treasurer.

No. 10 of 1910.
Department of Agriculture,
Administrator's Office,
Salisbury, 27th January, 1910.

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of hides of every description from North-Western Rhodesia and Portuguese East Africa. I do further declare, in terms of section 5, sub-section (6) (a), that any hides introduced in contravention of this prohibition shall be confiscated and destroyed.

Any person contravening the provisions of this Notice shall, upon conviction, be subject to the penalties prescribed by the aforesaid Ordinance.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.
F. J. NEWTON,
Treasurer.

No. 70 of 1910.
Department of Agriculture,
Administrator's Office,
Salisbury, 7th April, 1910.

ESTABLISHMENT OF A POUND AT LUSCOMBE FARM, PLUMTREE.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Bulawayo, the existing pound at Sunridge, Plumtree, has been abolished, and a pound has been established on Luscombe Farm, Plumtree, in the fiscal division of Bulawayo, and that the said pound shall be available for the public from the 1st day of April, 1910.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council.
F. J. NEWTON,
Treasurer.

No. 79 of 1910.
Department of Agriculture,
Administrator's Office,
Salisbury, 7th April, 1910.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby direct that all cattle found within an area of twenty miles of the Crocodile River, in the native districts of Tuli and Chibi, in contravention of the provisions of Government Notice No. 47 of the 10th March, 1910, shall be forthwith destroyed.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council,
F. J. NEWTON,
Treasurer.

Department of Agriculture,
Salisbury, 12th May, 1910.

SERVICES OF GOVERNMENT VETERINARY SURGEONS.

IT is hereby notified for public information that the services of the Chief Veterinary Surgeon are not available for private work nor of Government Veterinary Surgeons at any centre where private Veterinary Snrgeons are practising.

ERIC. A. NOBBS,
Director of Agriculture.

Department of Posts and Telegraphs,

Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EYRE,
Postmaster General.

General Post Office, Salisbury,
20th July, 1909.

South African Stud Book

A RECORD of all classes of Stock, the object being to encourage the breeding of Thoroughbred Stock, and to maintain the purity of breeds, thus enhancing their value to the individual owner and to the country generally.

Applications for Membership, and entries of Stock should be addressed:

For Cape Colony to

A. A. PERSSE, P.O. Box 703, CAPE TOWN.

For Transvaal to

F. T. NICHOLSON, P.O. Box 134, PRETORIA.

For the Orange River Colony

E. J. MACMILLAN, Government Buildings, BLOEMFONTEIN.

A. A. PERSSE,
Secretary South African
Stud Book Association.



The Melsetter Exhibits at the Agricultural Shows.



THE RHODESIA

AGRICULTURAL JOURNAL.

Edited by the Director of Agriculture
assisted by the Staff of the Agricultural Department.

PUBLISHED BI-MONTHLY

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Editorial.

THE LEGISLATIVE COUNCIL.—The only measure of any Agricultural importance passed during the recent Session was a short Ordinance applying to Poultry, the provisions secured for other forms of live stock under the "Animals Diseases Consolidation Ordinance of 1904." This was desirable in view of the very considerable importations of poultry which are constantly taking place for eating and breeding purposes both from Portuguese East Africa and from the South. It will now be possible in case of an outbreak of destructive disease amongst poultry to take steps to prevent spread and to enforce curative measures.

The sum appropriated for the encouragement of the agricultural industry and the administration of laws connected therewith shows an increase over last year and amounts to £23,166 for the Agricultural Department, and £32,618 for the Veterinary Service. Besides increases in personnel, the most noteworthy additions are provisions for the establishment of a Stud Farm and Experimental Station,

for loans for fencing purposes, forestry, and the construction of dipping tanks.

There is a prospect that a Special Session of the Council may be called to deal primarily with Agricultural matters of urgency, fencing and further steps for the suppression of disease.

AFRICAN COAST FEVER, COMMITTEE OF ENQUIRY.—Another outcome of the recent Session has been the appointment of a Committee of the interests involved, for the purpose of obtaining a consensus of public opinion as to what steps may be taken to give further protection to the country from the ravages of destructive diseases of stock such as Coast Fever.

Mr. MacIlwaine, of the Law Department, is the chairman, and the other members consist of two farming and two mining representatives; Messrs. J. A. Edmonds and E. A. Hull for the former, and Captain Bucknall and Mr. J. Mack for the latter. Evidence is being taken at Umtali, Marandellas, Salisbury, Mazoe, Gatooma, Gwelo, Bulawayo, Gwanda and possibly other centres. The scope of the enquiry is very wide, as the following copy of the terms of reference will indicate :

1. The causes of the periodical and widely-distributed cases of outbreak of East Coast Fever ;
2. The question of movement of cattle and ox transport, and what restrictions, if any, should be made, either temporarily or permanently, or locally or generally ;
3. The question of compulsory and voluntary fencing of public and private lands ;
4. The management of commonages in respect of the use and retention of horned cattle thereon ;
5. The question of measures, local and general, for the prevention of the disease.

An early report is looked for, on which it is hoped that action may be possible, as it behoves all who have interests at stake to tender their views as evidence, for there is no doubt but that the decisions to be arrived at now as a result of this Enquiry, will have lasting consequences. If they do

not do so, important points may be overlooked or particular cases remain unprovided for, which might later on entail undue hardship or prove a source of danger.

AFRICAN COAST FEVER: THE OUTBREAK.—An alarming spread of African Coast Fever has to be recorded, full details of which will be found in the Veterinary Report in this number. The measures necessary for suppression and limitation of the infection have been taken, and it is so far satisfactory to observe, that these have been effective in preventing serious spread. The question before us is not so much what to do when outbreaks are found as how to prevent their recurrence.

Some consolation is to be derived from a comparison of the spread of disease here and in the South. The origin of the outbreaks remains unexplained; while both in Matabeleland and Mashonaland several separate centres of disease have been located near together, there is no indication of any connection with other known centres, and no chain of infection can be traced.

FENCING FARMS ON THE RAILWAYS. AN OFFER.—The Beira and Mashonaland, and Rhodesia Railways make the important announcement that the Railway Companies are prepared to spend at once the sum of two thousand pounds (£2,000) in fencing the line through occupied farms, and will be agreeable to bear the entire cost on both sides if farmers are willing to expend an equal amount in the fencing in of their farms, or as an alternative, the Railway Companies fence one side of the railway through any farm, if the owner will undertake to fence the other side. Applications should be addressed to the Manager of Railways, Umtali, by persons desirous of taking advantage of this offer. Additional sums will be available for this purpose in future years.

THE EXPORTATION OF MAIZE.—In the last issue we referred to the preference offered by the distiller and the manufacturer of maize products, like corn flour, maizena and starch for a high class, well developed uniform and dry sample, such as that exported last year from Rhodesia. The world's market price for maize has of late fallen materially, rendering such a premium yet more desirable, essential even if exportation to so distant a market is to remain profitable. Simultaniously with this depreciation in markets, we under-

stand that the offer made by the Railway Companies for exportation and sale at an inclusive rate of 2s. 6d. per bag has been withdrawn, and replaced by a similar offer, but on a basis of 3s. per bag, for a period of six months. This course has been found necessary on account of the increase of the sea freights by 6d. per bag. The result of these two factors jointly, the fall of the market, and the increased cost of exportation must adversely affect for the present the prospects of the Rhodesian farmer, reducing, as it does, so very considerably the margin of profit on the export of mealies to Europe. Should the market price fall further, then the outlet for our surplus is cut off, and we shall be faced with a glut. The mines cannot consume more than they require at any price; some outlet for the balance must, therefore, be found. To our own stocks must also be added that of Bechuanaland, for which Matabeleland is now the most accessible market, in view of the recent rearrangement of rates from the Protectorate for the north, while, owing to the geographical accidents, Umtali is the natural market for much of the grain grown in Portuguese East Africa. The time, forecasted by many, appears already to have come upon us when the farmer must look to some other form in which to sell his grain, and for the future must elaborate part of his crops into meat before he realises their value. If the market becomes congested and exportation unprofitable, a shrinking of the mealie acreage must ensue, and other crops be grown in place of it. The readiest transformation of maize is into pork and beef, but maize alone is not a suitable ration even for pigs, and must be supplemented by other grains, beans, and forage, especially such as is rich in albumenoids, like velvet beans and pea straw and lucerne, separated milk, butter milk, or whey; also by roots and other succulent food.

THE UNION OF FARMERS' ASSOCIATIONS.—The meeting of the Farmers' Congress at Bulawayo, on June 17th and 18th was chiefly remarkable for the amount of discussion condensed with the limited time available, a creditable and somewhat unusual record at gatherings of the kind. Lectures and papers of an instructive character were necessarily conspicuously absent, save that on rural education, reproduced elsewhere. The chair was occupied by Mr. J. A. Edmonds, and Mr. R. A. Fletcher, M.L.C., was elected president for the



Salisbury Agricultural Show—The Produce Section.

ensuing year. A considerable amount of solid work was transacted, and the debates were conspicuous for their business-like tone, a spirit of fair play, and earnest desire to focus the opinions of scattered associations and concentrate the strength of the farming community in the Farmers' Parliament. The value of such conference is hard to overrate, but it may be permissible to suggest that their interest would be enhanced by providing time for lectures of an instructional character on technical subjects followed by open discussion. The interest and pleasure of the deliberations might readily be increased, by arranging excursions to places of agricultural interest in the vicinity, as is customarily done elsewhere, and which add, if kept within reasonable limits, materially to the value of such meetings. It may also be suggested that the date of the Congress might well be fixed to precede, instead of follow that of the Legislative Council.

THE AGRICULTURAL SHOWS.—In spite of the unavoidable absence of cattle from all the three shows, there was much to attract and instruct the visitor, and perhaps for this very reason more attention than usual was paid to the inanimate exhibits. At Bulawayo and Salisbury implements made a very creditable display, and much labour saving and up-to-date machinery was in evidence, proving that both our dealers in, and our users of, agricultural machinery and appliances are awake to their own advantage. Labour scarcity is driving farmers to use mechanical devices wherever possible. The features of this section undoubtedly were a number of mealie shellers and graders, gang mould board ploughs for work on old lands in place of the disc plough and a variety of rollers, clod crushers and cultivators of many forms, indicating that the need for thorough tillage is realised. What produce lacked in quantity it more than made up in quality, and the average character of the entries was undoubtedly most satisfactory. Special articles appear in this issue dealing with the mealie exhibits and with butter. The special exhibts by the Melsetter farmers and by the Department of Agriculture, received considerable attention at all the shows, and will probably be repeated with improvements in other years. The necessity for rearranging the dates of our shows has been brought up, and this matter

should seriously be considered before next year, as the success of such gatherings greatly depends on their timeliness, and as each depends to some extent on others, the sequence and interval of time between them is an important factor in the success of all. The initial show of the Kimberley Reefs Farmers' Associatton was held on July 8, and proved quite a suecess, and affords an excellent example for other districts to follow.

A RHODESIAN LUNCH.—At Bulawayo a novel feature was the All Rhodesian Products banquet and the quality and variety of the viands speaks well alike for the country and the energy of those who brought the enterprise to a successful issue. For the benefit of those who were not present we reproduce the menu:—

SOUP.

Crême de Bulawayo.

FISH.

Crumbed Victoria Falls Fish.

ENTREES.

Steak and Giblet Pie.
Roast Khoraan.
Roast Stuffed Chicken.
Devilled Chicken.
Nyamandhlovu Sausages.

GAME.

Roast Haunch of Venison and Jelly.

JOINTS.

Roast Sirloin of Beef.
Roast Shoulder of Lamb.
Roast Leg of Mutton.
Roast Stuffed Sucking Pig and Charter Beans.

SWEETS.

Compôte of Fruit and Custard.
Rhodesian Tapioca Pudding.
Rhodesian Coffee Custard Tarts.

Salads. Jellies. Assorted Fruit. Cheese.

Rhodesian Café Noir.

Liqueurs: Rhodesian van der Hum.
Chishawasha.

RURAL EDUCATION.—The paper read by Mr. Duthie, the Director of Education, before the recent Congress of Farmers Association at Bulawayo deserves a wide circulation and the attention of all farmers in Rhodesia. We have pleasure in publishing it. Throughout the system of education which has been devised to meet the peculiar needs of Rhodesia, the bias to agriculture prominently appears. To children, who as adults are destined to inhabit this country, it is of the first importance that from the outset they should imbibe an interest in their surroundings and receive a training which shall make them turn for pleasure as well as for their livelihood to our rocks and rivers, our flowers and forests, our birds and beasts, so as to divert them from that craving for town life which the stereotyped forms of teaching are but too apt to engender. To this end emphasis is laid on native study, chemistry, botany, zoology and physics and on their application to our every day surroundings, although not to such an extent as to take away from a sound general education. The time is hardly ripe for us to follow the example of the sister states of the south in the establishment of Agricultural Colleges, though this will no doubt come before long, and sooner than many may think. The economic problems of Rhodesian farming are still in their early stages, and before much can be offered in the way of instruction, much has to be learned by the slow and tedious process of personal experience, assisted and somewhat accelerated by scientific experimentation. This Journal may be regarded, we hope, as a medium of technical instruction, and its increasing circulation is an encouraging indication of appreciation on the part of those for whom it was primarily intended. It must, however, be admitted that the power of the pen is much less than that of the spoken word, especially when words come not from one mouth but from many, from the interchange of ideas, and by personal interrogation and discussion. To this end we welcome the suggestion made in discussion at the Congress on Mr. Duthie's paper, and we can assure all interested that officers of the Department of Agriculture will be glad to give lectures, addresses or 'talks' on matters connected with the art and science of farming, or on their special branches of that far reaching subject whenever such can be arranged. Short courses of instruction have been suggested; the prime difficulty so far has been to secure the attendance at one time and place of a number of

farmers, whose calling demands their presence or prevents any prolonged absence from home. In a country of great distances like Rhodesia such courses of instruction, so effective in England, present special difficulties, but where there is a will there is a way, and if an attendance of hearers can be secured the provision of the instruction can be assured.

VISIT OF A DAIRY EXPERT. — In accordance with the announcement made in our last issue and through the Press generally, Miss Maidment has arrived in the country and is at present engaged in giving lectures and demonstrations at various centres. In the limited time at her disposal it has not been possible for visits to be paid to all places from which invitations were received, but a tour has been arranged so as to make the most of the available time, and to give as many as possible of those interested an opportunity of attending and receiving instruction. The programme includes lectures and demonstrations at Plumtree, Figtree, Bulawayo, Westacre, Insiza, Eldorado, Mboi, Marandellas, Umtali, Premier Estates, Mazoe, Salisbury, Gwelo, and Enkeldoorn. A considerable amount of interest has been manifested, and there can be no doubt but that much good will result. There is great scope for extension and improvement in our dairy management, and in turning to the best account what we have, and in increasing and improving our out-turn of butter, cheese, hard and soft, and also our poultry. Miss Maidment has found Rhodesian farmers ready and willing to benefit by her knowledge and experience.

FORESTRY.—Farmers will welcome the arrival of Mr. J. Sim, seconded from the Union Forest Department for the purpose of inspecting the natural forests of Rhodesia and reporting upon the potential wealth contained in them, and the best means of exploiting it, preserving it, and meeting at the same time our present and future requirements. The questions involved are complicated and vexed. All sections of the community have an interest in our forests as an asset, on climatic, hydrological and aesthetic grounds, for the present needs and in perpetuity. Moreover, the questions arise of afforestation of denuded areas in naturally treeless parts of the country, and the replacement of our often mean scrub by valuable exotic timber trees. Mr. Sim will visit

typical areas in different parts of the country with a view to making suggestions for their future management on sylvicultural lines, and to give an expert and unprejudiced opinion of the conflicting economic problems connected with forestry in Rhodesia.

THE AGRICULTURAL ENGINEER.—We have to announce the appointment to the staff of the Agricultural Department of an officer transferred from the Irrigation Department of Cape Colony, for the purpose principally of advising farmers on the utilisation of available water supplies for irrigation works, and more generally for studying the whole question of the water supplies of the country and the best means of developing them. Mr. W. M. Watt has had considerable experience of precisely this description of work in different parts of Cape Colony and has successfully conducted reconnoisances of river valleys, devised numerous small irrigation schemes for individuals, and personally carried out works of considerable magnitude. The scope here is wide and scarcely touched. Little or nothing is known of the off-flow of our catchment areas; of the quantities of water in our rivers; of the extent of land available for irrigation; of the amount of the rainfall which penetrates to depths and is obtainable by boring or well sinking; of the duty of water in Rhodesia, that is the amount required per acre to produce certain crops, and other kindred problems without end. All this will come within the purview of the Agricultural Engineer. The arrangement made for making his services available to the public will be found in another page under the heading of Departmental Notes.

THE VETERINARY STAFF.—We have pleasure in announcing the arrival of two veterinary surgeons, one additional one and one in the room of Mr. R. F. Stirling resigned. Messrs. Offord and Oliver arrive at a time when their presence will be especially welcome, to assist the severely taxed powers of the present staff to deal with the scattered centres of disease. A third veterinary officer, additional to the present strength, is expected shortly. In connection with the outbreak of Coast Fever a number of special Cattle Inspectors are employed and a large number of Police are in the field,

CATTLE FORM THE NORTH.—We call attention to the regulations published amongst the Government Notices, admitting under certain stipulations cattle to enter Southern Rhodesia from North Eastern Rhodesia and from Nyasaland. While acceeding to the very strongly expressed wishes of our northern neighbours the admission of cattle will also be welcomed by us, preventing as it does any fear of the scarcity of meat, and securing a supply of much needed breeding stuck. The admission of cattle from North Western Rhodesia is also probable at an early date. Stringent conditions with regard to health are imposed, and certificates from qualified veterinary surgeons are insisted upon. The recent appointment of three veterinary officers beyond the Zambezi is a step of which all southern breeders will heartily approve, adding as it does materially to our sense of security from that quarter. It is reported also that a veterinary surgeon is about to be appointed for the Mozambique Company's territory, a further safeguard to Rhodesia on the east.

PRIZES FOR BOTANICAL COLLECTIONS.—In continuance of the competitions organised last year, the Department of Agriculture offers prizes for the collections of dried plants of economic importance, whether as weeds, pests, food, or commercial commodities. Prizes of the following values are offered: £5, £4, £3, £2 and £1, and more may be given if occasion warrants. Profiting by experience gained last year the conditions of entry have been somewhat modified so as to render it easier to make collections and to ensure a large entry. Details will be found under the heading of Departmental Notices.

ERRATA.—A transposition of figures occurred in the Editorial paragraph in last issue dealing with the number of farmers in Rhodesia. While the details for each native district is correct the total figures should read as follows:

Mashonaland	...	...	...	990
Matabeleland	...	...	...	480

Rural Education in Rhodesia.

By G. DUTHIE, M.A., B.A., F.R.S.E., Director of Education.

A Paper read before the Farmers' Congress, Bulawayo, 17th May, 1910.

The aim of this paper is to explain in a succinct from the present facilities for education in Rhodesia. The title is general so that the paper may be of use to more than those interested in agriculture, but special attention will be given to education as it affects farmers and farmers' children. Your secretary was good enough to hand me proposals that have been put before the Director of Agriculture for bringing expert knowledge and possibly training within the reach of those who are now farming on the land of Rhodesia. These, although they have my full sympathy, are outside my province at the present time, and I shall restrict myself to indicating what is being done for pupils in Rhodesia, and what education in this territory is intended to lead to in the future. It goes without saying that for farmers' children, as for other children, the first essential is a sound elementary education, and I think it may be fairly claimed that even in this territory, young as it is in the stage of development, this is within the reach of a very large proportion of its inhabitants. One need not delay over the children in towns or within the reach of schools. The main problem, and a difficult and costly one, is how can a State system best include the youth in outlying districts? Although the methods adopted have been explained on previous occasions it is likely that they are new to many, especially to new arrivals in the country, and as it is well to have them for the purposes of your association in an easily available form I make no excuse for explaining them somewhat in detail.

FARM SCHOOL.

The first method is by means of farm schools, and for the sake of those who are familiar with farm schools elsewhere I may explain that the "farm schools" implies something different from what it would signify in other States, as the conditions in Rhodesia for establishing these schools are much easier for the farmers. If ten children can be colleced together, of school age, the Government is prepared to consider the institution of a school on conditions which I shall explain. A schoolroom must be built by the farmers interested. This need not be more than a hut, a form of building which, if well constructed, is found to be very suitable on account of its cool shelter. It is naturally in the interest of the children and therefore of the farmers that the hut should be roomy and well lit. Benches and tables would also have to be provided by the farmers. The Government provides all other school requisites, and pays the teacher's salary. The school fees are per term (there are four terms in the year): 15s. for infants; 20s. for Standards I. and II.; 25s. for Standards III. and IV.; 30s. for Standards over Standard IV. These fees include all books, stationery, etc., which are provided by Government. The farmers would have to see that there was accommodation for the teacher, who would pay for board and lodging. Naturally it is in the interest of all that the teacher should be well housed. Farm schools have been established, one in S. Melsetter, one in N. Melsetter, one in the Imbeza valley near Penhalonga, one near Marandellas, and six in the Charter district. Several have been started along the railway line from Bulawayo to Plumtree, but owing to migration of the farmers these have had to be discontinued. Six others are under consideration in various parts of Rhodesia. I should have added in the cases of fees that if there are three children the third pays half fees, and if more than three all others are free.

BOARDING SCHOOLS AND GRANTS.

Now, for children on isolated farms, where ten children cannot be collected together. The Administration has established boarding schools at Melsetter, Umtali, Gwelo, and Enkeldoorn. The Beit Trustees have two boarding houses in Salisbury, and in connection with the new schools

in Bulawayo, boarding houses will be arranged for. The boarding fees in these schools are not higher than £12 10s. a term, or £50 per annum. In addition to this a few incidental expenses have necessarily to be incurred. As many farmers require at present all their capital to work their farms the Government has instituted a system os boarding grants of £20 per annum to assist in making it easy to send children to a boarding house. The number of these grants is 100 and to this the Beit Trustees have added 100 more. The residence of the pupil must be more than three miles from a school and the pupil must be eight years of age or over. As the grants are to aid parents who cannot afford to pay the full fee, a declaration is required to that effect. The total number of these grants has been taken up for the present, but H.H. the Administrator has stated during the recent session of the Legislative Council, that should the necessity for more be demonstrated, they may be forthcoming. It has to be remembered in this connection, that when a pupil reaches the VI. standard, Beit scholarships for boarders are available £40 per annum for three years. These are to enable pupils to continue their studies to the matriculation standard of the Cape University. The total number of these scholarships is 20 every year and they are awarded after competitive examination.

THE EDUCATION PROVIDED.

The next all-important question for parents in Rhodesia is the range and character of the education provided. In the minds of most, the education provided by Government is associated with what is commonly called elementary education, the main items of which are reading, writing, and arithmetic. In Rhodesia, the Administrarion provides much more than this, and undertakes education as far as the matriculation standard of the University of the Cape of Good Hope, so that the scope of State education here, includes secondary as well as primary education. There is, therefore, no necessity for a pupil to leave the territory before he is ready to enter a university. As to the education of farmers' children and agricultural educatic n, which are not, of course, necessarily the same, I would not indicate the possibilities. Sons of farmers may wish to study for any of the professions. The

stepping stone is matriculation, and it is at their feet. But supposing they wish specially for an agricultural education, what provisions are there? For those whose ultimate ambition it is to be specialists in some particular branch of agricultural science, or to study at an agricultural college, the best course is to proceed to matriculation, so that they too are provided for. But it may be asked is there any special preliminary training for those intending to study at agricultural colleges? The answer is thah it is possible to matriculate by taking such subjects as chemistry, physical science, botany, zoology, along with other subjects in the examination. Now it is impossible for us with so few pupils in the schools to provide specialist teachers in all these subjects, but it would be equally impossible for any schoolboy, even if he were desirous and willing, to undertake all of these in addition to the compulsory subjects. Therefore a wise selection had to be made. The ordinary school curriculum now includes English, mathematics. French, Latin, and science (physics and chemistry), geography and history. These subjects are taught in the Salisbury High Schools, and will be taught in the new schools in Bulawayo. The advantages of choosing physics and chemistry as the science to be taught are so overwhelming, and, if I may say so, so obvious that there is simply the one choice. As a basis for agricultural science none better could have been adopted. Among the other subjects, there are only two to which a certain class of people may object, but certainly not enlightened farmers; I mean Latin and French. Supposing the argument is taken only on the lowest possible utilitarian consideration—and by utilitarian I mean such as have a cash value—elementary Latin is of great assistance in the study of botany, zoology, pathology, physiology, etc., all of which are necessary for the full scientific training of the modern farmer. And as for French I do not think any intelligent farmer would object to his son learning the language of a people famed for their cultivation, their intensive culture, their vine growing, and their study of all plants and animal diseases. But it is almost an insult to suggest that the question should be viewed merely from the low utilitarian point of view. A farmer, who is a farmer and nothing more, may be of a certain value to the community, but if he is to take an intelligent interest in the affairs of the State, if he is to take a broad

view of the advancement of the country, if he is to be a useful settler, and if he is to take his part in the government of the country, and perhaps in the framing of its legislation, it is essential that his education, specialised in his own particular work, should nevertheless be on the broadest possible base.

But while a curriculum for our schools has been chosen sufficiently broad to meet all cases consistently, with our available resources, it has to be added that subjects which more especially meet the needs of our future farmers have been included. For the cultivation of observation, for the efficient manipulation of tools, for the study of all living things; we have nature study, woodwork, and drawing. For the new Boys' High School, Bulawayo, a teacher has been appointed for his special knowledge of woodwork and science, as well as for his ability as a teacher. But the wide subject of nature has been still more specialised, and a farm reader," which deals specially with farming in South Africa, has been introduced as a reader in our schools. In this connection I may say that your worthy legislator, Mr. Fletcher, has offered prizes to the pupils in the new schools in Bulawayo for an examination in this book, just as Mr. Newton, the Treasurer, has done in Salisbury. As I rarely lose an opportunity of begging for my schools, may I put it strongly to you that your various local farmers' associations could assist in the advancement of the knowledge of farming, by offering similar inducements in their different districts.

MAIZE GROWING.

But we have also our maize growing competitions for which the Government generously offers prizes. And here again you may assist. If there are successful exhibitors of maize at your Bulawayo Show among you, may I ask that you let me have your best cobs so that they may be distributed among the schools as specimens of what ought to be grown.

GRASS COLLECTING COMPETITION.

We had also our grass-collecting competition, and it is noteworthy that a school boy on his first attempt succeeded

in finding five new grasses in Matabeland, some of which now go by his name.

EDUCATIONAL LADDER.

And now, in conclusion, allow me to indicate how a Rhodesian school boy with practically little assistance, from the age of 12 or 13 may reach the highest scientific agricultural education. At the age of 12 or 13 he ought to have finished his standard VI., and he is then eligible for a Beit scholarship of £40 per annum if he is a boarder, and £20 per annum if he is a day pupil. There are 20 such scholarships and they are available for three years, by the end of which period he ought to be able to pass a matriculation examination of the Cape University. At this stage he has another helping hand held out to him. There are three Beit bursaries of £100 each, available for three years, awaiting the three most successful candidates at the matriculation examination if they pass in the first or second grade. These are to enable Rhodesians to go into residence at one of the colleges in South Africa, and among these agricultural colleges are included. But suppose the budding agricultural scientist wishes to proceed further, it would be advisable for him to proceed to take the science degree at the Cape University, choosing such sciences as are best suited for his purpose. He would be able then to compete for one of the three Rhodes' scholarships of £300 a year, which are available for three years. He would be in a position then to apply himself to research work, which is specially provided for at Oxford University.

I have tried to put in as succinct a manner as I could the possibilities of education in Rhodesia for farmers' children. Doubtless many points have been omitted, and many questions may arise. I very much regret that I shall be unable to answer them in person, but if they are handed to the secretary in writing, and forwarded, I shall be pleased to answer them, either through the Press or directly as requested.

Standard Types of Rhodesian Maize and their Points.

By H. GODFREY MUNDY, Agriculturist and Botanist.

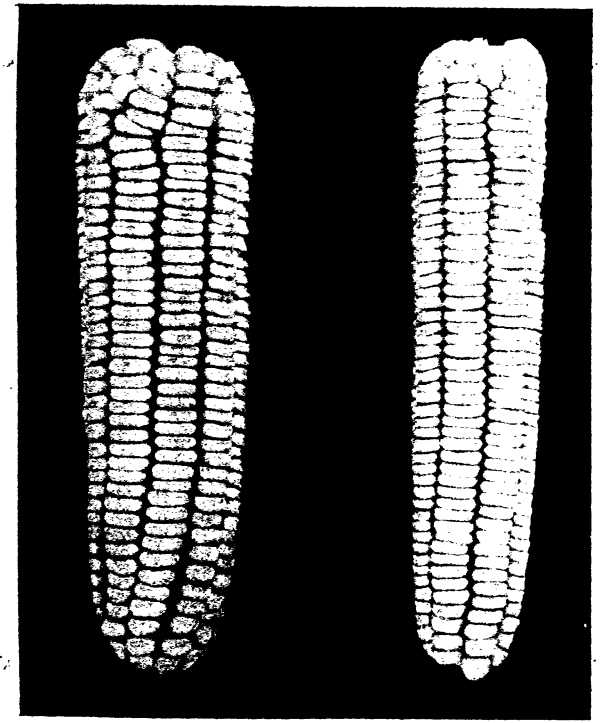
The maize growing industry of this territory is year by year becoming of greater importance and more attention is being paid to seed selection. There is still room for very great improvement, but, as indicated by the exhibits of maize ears at the recent Agricultural Shows, a stage has been reached when many growers require more concise information regarding the points of the prize ear. Enquiries are often made also as to which is the best kind of maize to grow on a certain class of soil, but with the present knowledge at our disposal it is impossible to give a definite reply to this question, and we must therefore confine ourselves to a discussion of their general characteristics. The standard kinds of white maize generally grown are Hickory King, Boone County, and Salisbury White, and in principle it is very desirable that only one kind should be grown on each farm, and as far as possible in each district.

If several different kinds are raised within a short distance of one another, it becomes next to impossible to prevent hybridization, and as long as this occurs between two breeds of different type, the best efforts to secure a standard type by annual selection of seed will be nullified. The point is brought out very clearly in the case of several farmers who are growing Salisbury White—an unfixed hybrid. When the grain shows a tendency to become too light and too much inclined towards Horsetooth form, some of these growers proceed to re-introduce into their picked seed a certain proportion of 8-row Hickory King with the object of increasing the size of the grain and decreasing the size of the core. This goes on year after year, and instead of obtaining a fixed type, this object is as far off as ever, and the number of gradations in the form of the ears and grain is increased rather

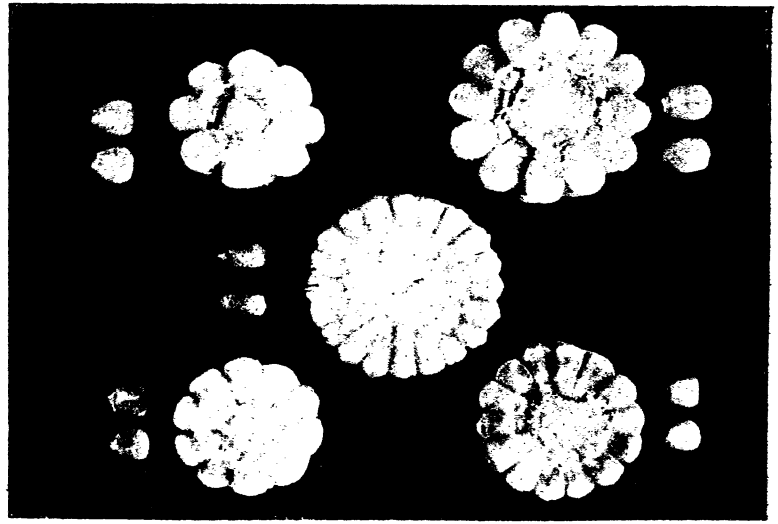
than lessened. The same methods of selection which are followed in the case of Hickory King and Boone County are equally applicable to Salisbury White, though since in one case we are working on a fixed type, and in the other on a hybrid, the process of establishing a pure Salisbury White will require greater care and attention. Growers of this strain, however, maintain that it is the hardiest and best cropping maize in the country, and if this is so, it is surely well worth their while to grow it in such a manner that it will breed at least approximately true to type.

Several farmers are supporters of Boone County, and contend that no other maize will crop so heavily. It is admittedly true that on good land and in a favourable season the yield per acre is exceptionally heavy. On the other hand it does not appear to be a kind well suited to poor land, and from observations made locally it shows a tendency to degenerate unless most carefully selected each year to the best type. Its influence as a hybridizing factor is very marked, and once the strain is introduced either accidentally or intentionally, hybrids appear to revert to the worst form of Boone County with annual regularity. For this reason, and also owing to the fact that the grain is of different size and appearance to that of either Hickory King or Salisbury White, and in marketing should be hept separate from these, it seems desirable that supporters of Boone County in particular should, if possible, grow this kind only on their farms.

Hickory King is acknowledged to be a hardy kind well suited to our poorer soils, yet under favourable conditions able to crop heavily, and producing a grain which appears likely to create and meet a special demand on the European market. Three types of Hickory King are met with—the 8-row, the 10-row and the 12-row. In the Transvaal 12-row Hickory is identified with Hickory Horsetooth, and in the writer's opinion it would be better to disclaim a 12-row Hickory in Rhodesia and to merge it into Salisbury White—the reason being that both are 12-rowed maize yet the grain of the former is considerably smaller than that of either 8 or 10-row Hickory while not having the length and weight of that of Salisbury White.



Hickory King (Eighth Row)—Maize



Hickory King (8 row).

Hickory King (10 row)

Boone County

Salisbury White

Golden Eagle

In the prize list 8-row and 10-row Hickory King should each form separate classes, and though at the present it is not advisable to lay down definite standards to which exhibits should conform, some indications which may be helpful may be given. In the United States of America, where the various kinds of maize have been grown and studied for a number of years, it has been possible for the Corn Breeders' Associations to draw up a scale of measurements which, when fulfilled by an ear of maize, will give the maximum yield consistent with its time of maturity and other vegetative characteristics in the field. This we cannot yet do in Rhodesia since, taking 8-row Hickory as an instance, ears of eight, nine, and often ten inches in length are met with, and it may be that with careful growing and breeding an 8-row Hickory King with an average length of ear of ten inches may be produced, and so prove a more profitable kind to grow than 10-row Hickory or Salisbury White.

The following standards have been arrived at by means of measurements and weights taken at the recent agricultural shows, and of selected ears from different crops throughout the country. A fuller knowledge of the subject may, in course of time, give reason for these to be reconsidered, but meantime they may serve as an indication of what should be aimed at on the show bench and in selecting for seed—since the prize ear is the one which, if reproduced in form and appearance throughout the whole crop, will give the maximum yield of grain per acre.

	Length in inches.	Circumference in inches. (2 inches from butt)	Approx. average weight of ear.	Percentage of grain to ear.
Hickory King ... (8 row)	8½—9	6—6½	11—12½ozs.	85—90
Hickory King ... (10 row)	9—9½	6½—7	13—13½	83—85
Salisbury White	8¾—9	7—7¾	14½—15½	86—88
Boone County ...	10—11	7½-8½	17 ozs.	84—88
Golden Eagle ...	10—11	7½—8	17½—18 ozs.	80—85

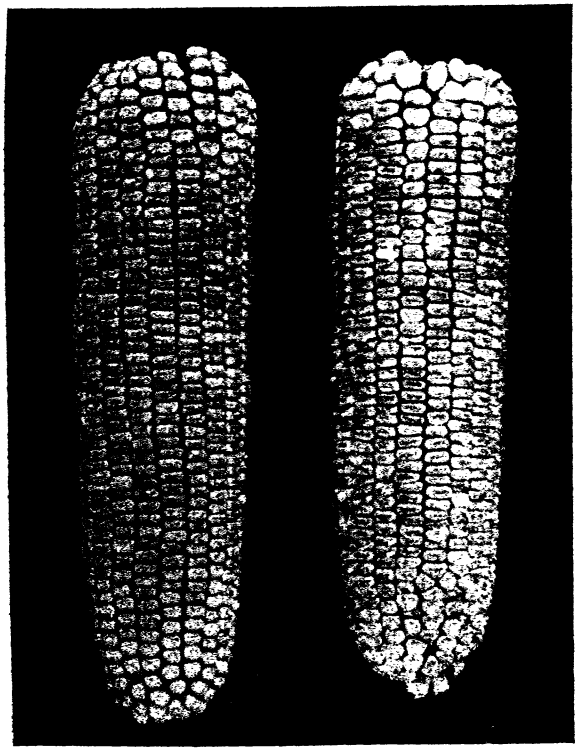
In America the percentage of grain to ear is often placed as high as 90, but we have not yet found any Rhodesian ears with so high a percentage, though in selecting for seed the higher standard should be aimed at.

Most farmers know the appearance of the 8-row Hickory, with its large flat grains and exceedingly thin core which should be white in colour and not red as is occasionally met with. The 10-row Hickory is similar in many respects, and in obtaining this type it does not appear essential to sacrifice the size of the grain to any great extent. The main points of difference being the increased number of rows with increased circumference measurement and smaller spacing *between* the rows.

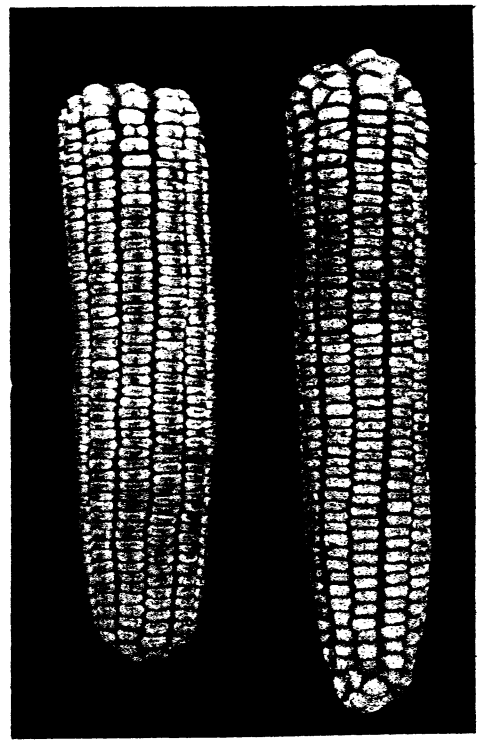
Salisbury White (a cross between Hickory King and Horsetooth) is a 12-rowed type, spaces between the rows, small. Grain wide at the butt, long and somewhat of Horsetooth shape, though more slowly tapering than the pure Horsetooth. Length of grain is most pronounced in those ears shewing some roughening at the broad end of the kernel, and this should be considered a characteristic, but in selecting for seed it seems advisable to discard ears shewing this type *too pronouncedly*, otherwise there is a danger of producing grain with an excessive proportion of husk.

Boone County is fairly well known, and a lengthy description should not be necessary. The number of rows varies from 16 to 22, but in practice, ears with 18 to 22 rows will usually be of better shape—that is cylindical and not tapering. The appearance of the grain differs considerably, some ears producing grain excessively roughened at the broad end and so inclined to be husky. The same appearance is found in ill developed ears, and both for the show bench and for seed, ears with the kernel well developed at the summit appear preferable, though this also may be carried too far and so depart from the standard type.

Golden Eagle is a medium late yellow variety of good cropping powers and in particular favour with Mazoe farmers. It is doubtful whether it has any advantage over



Boone County Maize.



Salisbury White Maize.

the heavier yielding whites, and since there is difficulty in locally disposing of yellow maize, and since in export uniformity of grain is of the utmost importance, its cultivation does not seem worthy of encouragement without greater evidence of its value.

In general Hickory King appears the most suitable kind for the poorer soils throughout Rhodesia. Many growers claim that year in and year out it crops as well as other supposedly better yielders. It is undoubtedly a fact that under most unfavourale conditions, in bad seasons and on poor or newly broken land it will give surprisingly good returns per acre. The grain is generally of good quality and breeds true to type. Should experience prove that by selection the length and weight of the Hickory King ear can be increased without seriously affecting its time of maturity, it will undoubtedly become an even wider favourite than it now is.

The exhibits of maize ears on the recent agricultural shows seemed to indicate that some farmers do not quite know how to select show ears.

The following is the score card which the writer made use of and indicates the value set on each point:

SCORE CARD

	POINTS Possible	Awarded
1. Uniformity of Exhibit	5	
2. Trueness to type and breed	5	
3. Shape of ears and straightnes of rows ...	10	
4. Colour of grain	5	
5. Colour of cob	5	
6. Market condition	5	
7. Quality of tips...	5	
8. Quality of butts	5	
9. Kernel uniformity and length	10	
10. Length of ears...	10	
11. Circumfenence of ears	5	
12. Space between rows	5	
13. Space between kernels...	5	
14. Percentage of grain to ear	20	
Total	100	

In exhibiting ten ears of maize one of the important features is to have the ears uniform in size and general appearance and true to type. In South Africa parti-coloured grain is not encouraged, and exhibits showing evident signs of hybridization with a yellow variety should be disqualified.

By comparing the standards of measurement with the score card it will be easy to see the type of ear likely to win on the show bench. In conclusion, grooming of the ears to remove stray silks and taking out the shank cleanly to shew the butt to best advantage is recommended, but "doctoring" of the tips or kernels is not allowable and spells disqualification.

We are often asked which kind of maize gives the best yield of grain per ear, and as the result of a number of trials the following weights are given of good average field ears not necessarily show ears:—

	Weight of ear, ozs.	Weight of grain, ozs.	Weight of core ozs.
Boone County ...	17 3/16ths	14 5/16ths	2 7/8ths
Salisbury White ...	15	13 3/16ths	1 13/16ths
Hickory King (10 row)	12 1/4th	10 15/16ths	1 5/16ths
Hickory King (8 row) ...	10	9 1/16th	15/16ths

As far as possible all ears weighed were the same length, namely, nine inches, which, as shewn in the table of standards is on the low side for a prize Boone County ear. The above weights must not however be taken too literally, since the factor of two ears per plant as against one must be taken into account together with the question as to whether Hickory King might not in many instances be planted more closely than Boone County or Salisbury White, and so carry a larger number of plants per acre. These facts can not be established on paper, they must be worked out with nature in the field and to do so several years of experiment are necessary. Meanwhile however it may be borne in mind that the fewer number of varieties we can confine ourselves to the better, since this will facilitate the handling of grain throughout the country, and when export is necessary will strengthen the standing of Rhodesian maize of one type and quality.

The Relationship of Ticks and Animal Disease.

By RUPERT W. JACK, F.E.S., Government Entomologist.

EAST COAST FEVER.

It it now widely known that East Coast Fever is carried from animal to animal through the agency of ticks, and this is the sole known means by which the disease is conveyed in nature. The precise part played by the tick is, however, not generally familiar, the publications on the subject, which originally appeared in the Agricultural Journals of the Cape Colony and the Transvaal, not being available to the majority of Rhodesian farmers. It is the aim of the present paper to explain in simple form the main facts in connection with the transmission of the disease, for it is not to be doubted that a wider knowledge of the subject, must react beneficially on those concerned with the scourge in this country.

Five species of ticks have up to the present been experimentally shown to be capable of carrying East Coast Fever. These are all closely related to one another, and are grouped together by scientists in the genus *Rhipicephalus*. These five species are, (1) The Brown Tick (*R. appendiculatus*). This is the species which does most of the damage, see Plate I., Fig. 1. (2) The Black-pitted Tick (*R. simus*). (3) The Red Tick (*R. evertsi*), see Plate I., Fig. 3. These three species are all common in Southern Rhodesia. (4) The Cape Brown Tick (*R. capensis*), may occur in these territories but is at least rare. (5) The Shiny Brown Tick (*R. nitens*) which occurs commonly in the Western Province of the Cape Colony, and is also reported from the Transvaal. This and the preceding species have not yet been recorded from Southern Rhodesia. As all the species of the genus that have been tested, have been proved capable of conveying the disease, it is probable that other members, of which there are several in this country, are also guilty.

It is now desirable to outline briefly the life history of the *Ixodidæ*, the family to which the cattle ticks belong. The

life history is essentially similar in all members of the family, but certain species have slightly modified habits.

The engorged female, which is the tick as most generally recognised, having completed the process of filling herself with blood, drops off the animal to the ground, and seeks a sheltered spot in order to lay her eggs. If the ground is sandy and soft, she may burrow an inch or so into the soil. If it is hard, she seeks what shelter she can under a stone or a lump of earth, in little hollows at the roots of a tree or bush, or at the base of a tuft of grass. Here in the course of a few days, the period varying greatly according to temperature, she commences to lay her eggs. This operation takes several weeks, dependent on temperature, and when completed the female has become a dead and empty sack, and before her are clustered several thousands of eggs, (see Plate III.) Temperature again plays a great part in determining the period that elapses before the eggs hatch. The period also varies greatly with the different genera of ticks. With the common Brown Tick at summer temperature, the period would be about six weeks. The baby ticks that hatch out constitute the first stage of the tick and are termed *larvae*. (See Plate II., Fig. 1.) They are very minute and have only three pairs of legs. When first hatched they are quite soft, but harden in the course of a day or two, and crawl up the neighbouring stems of grass to wait until brushed off by some passing beast, to which they attach themselves. They engorge themselves with blood in from two to four days, and in the majority of species drop off to undergo their moult. The engorged larvae of the Red Tick, however, remain attached to their host, moult and re-attach themselves to the same animal. The majority, however, moult in the grass, the period taken varying greatly, as with all the other transformations of ticks, according to temperature. When moulted the ticks have entered the second stage, acquired four pairs of legs, and are termed *nymphs*. See Plate II., Fig. 2. They crawl up the grass stems again and wait there until brushed off. Having become attached to a fresh host, they engorge themselves in the course of seven or eight days and drop off into the grass. The engorged nymph of the Red Tick also drops off to moult. Having moulted, the ticks have now entered the third or *adult* stage. The male is now easily

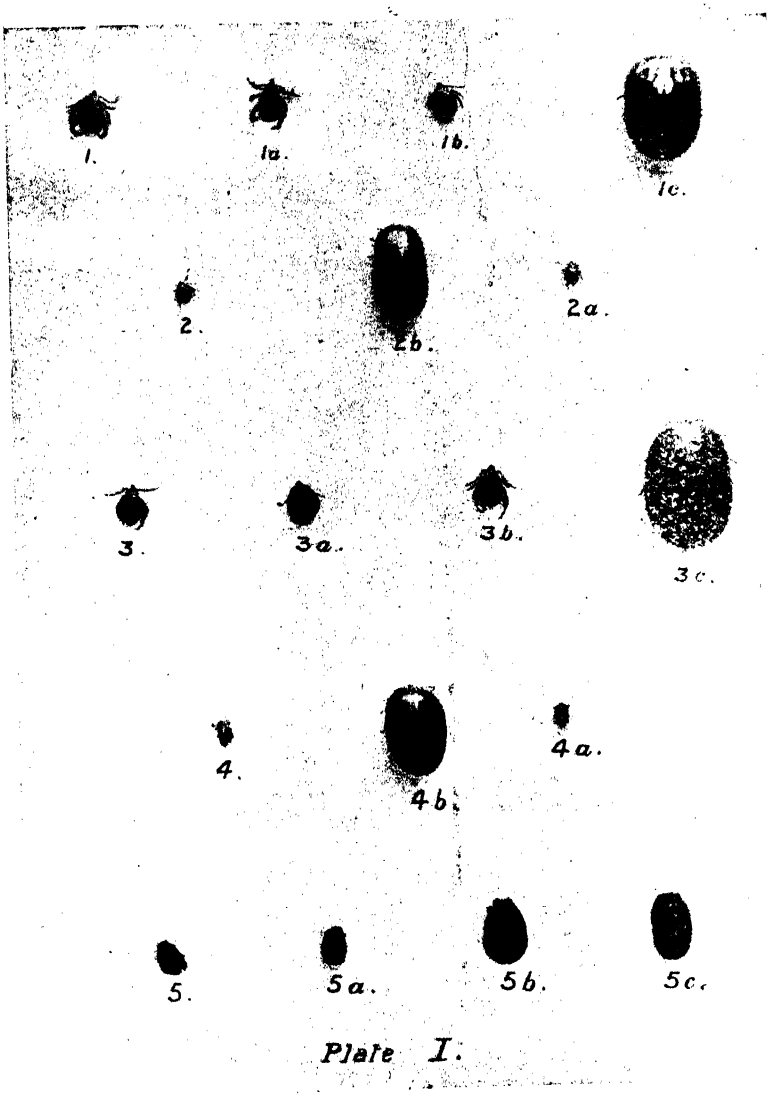


Plate I.

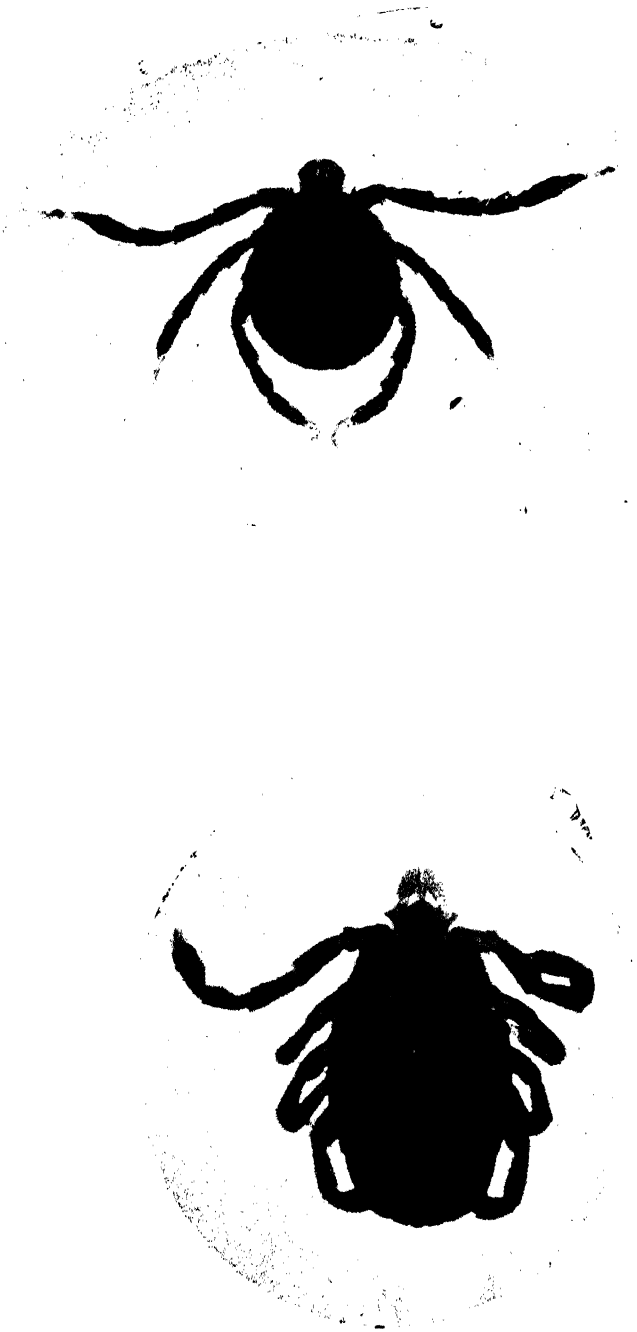


Plate II.



Plate III.

distinguishable from the female. The whole of his back is covered with a hard chitinous shield, whilst the female possesses only a small shield, situated immediately behind the mouthparts, the rest of her body being comparatively soft and capable of an enormous degree of distension. The adults repeat the performance of the larvae and nymphs in ascending the grass stems. When attached to a host the male imbibes very little blood, whilst the female, as is well known, engorges herself to an enormous extent. In removing an engorged female from an animal, the comparatively small male may often be seen attached to the skin next to his mate.

Having now seen that ticks go through three stages or feedings after leaving the egg, and that the species concerned with East Coast Fever, with the exception of the Red Tick, in the natural sequence of events feed on three different hosts, unless they chance to be picked up again by the same beast, and that the Red Tick feeds on two, we will now consider the method by which the disease is carried from the sick to the healthy animal.

Supposing a newly hatched larva attaches itself to an animal suffering from East Coast Fever; in the course of a few days it drops off engorged, moults in the grass, and is ready to feed again as a nymph. If this nymph feeds on an animal capable of taking East Coast Fever, it is liable to give it the disease. The organism of the disease, presumably goes through a certain development in the body of the tick and invades the salivary glands, and in a form capable of reproducing itself, is injected into the blood of the animal when the nymph attaches itself. In a similar manner if the nymph feeds on an animal suffering from East Coast Fever, and in the adult stage attaches itself to an animal susceptible to the disease, it may convey infection. It is important to note that all experiments carried out up to the present, have indicated that the tick, in order to be infective, must receive infection in the stage previous to that in which it feeds on the susceptible animal. If the larva feeds on a sick animal and the nymph on a dog, or other animal not subject to the disease, the adult has never under experiment proved capable of infecting a susceptible animal. In addition it has been found that the larvae may feed on a sick animal, and being

applied to a susceptible as nymphs, infect it, but the nymphs falling off before the animal showed any signs of fever, the resulting adults are harmless when applied to an ox capable of taking the disease. Numerous attempts have also been made to infect animals with ticks fed in the previous stage on animals *recovered* from the disease, but every attempt has resulted in failure. Finally a tick which has infected an ox, if forcibly removed before it has engorged, or in the case of an adult male at almost any time, may, if it attaches itself to a fresh susceptible animal, infect the latter with the disease. These facts have considerable importance in dealing with the disease. Firstly, as far as experiment has been able to demonstrate, a tick, once it attaches itself to an animal incapable of taking the disease, such as buck, hare or dog, loses all power of carrying infection unless forcibly removed. This obviates the chance of the disease being spread by animals such as hares, jackals, buck, etc. carrying ticks from the infected areas. Secondly, a healthy ox is probably not capable of dropping infective ticks on the veld. The term "probably" is used because it takes a very large number of experiments having a negative result to constitute absolute proof. Thirdly, it has been practically demonstrated that recovered animals are not capable of infecting others. From these facts it is clear that the one source of infection is the sick animal and those that have come in contact with him, that is to say, those that have been on the veld over which he may have dropped infective ticks, and it is against these that measures of control need to be put into force. The destruction of the sick animal and the careful quarantining of "contacts" are the methods by which East Coast Fever can be controlled.

REDWATER.

It is, however, not only in transmitting East Coast Fever that ticks show themselves such dangerous enemies of the community in this country. The common Redwater of cattle is conveyed by another species of tick. This is the common blue tick (*margaropus decoloratus*), see plate 1, fig. 2, which is familiar to everyone. In some parts of South Africa a closely allied blue tick of similar habits (*M. australis*) aids in the work. The habits of these ticks differ from those of

the preceding in that they feed on but one host in the course of their lives. Both the *larva* and the *nymph* moult whilst remaining attached to the host, the life cycle from the time the young larva attaches itself to the appearance of the engorged females occupying from twenty-one to twenty-five days. The engorged female, as usual, drops to the ground to lay her eggs. Under these circumstances it is obvious that some other methods of transmission than that of the ticks concerned with East Coast Fever is necessary if the tick is to convey disease. In this case there is no opportunity of the disease being conveyed from stage to stage as all the stages are passed on one animal. As a matter of fact, the infection passes through the egg. The tick feeds in one generation on an animal sick or recovered from the disease. The recovered animal is the most important factor in the perpetuation of this disease. It is owing to the recovered animal's capability of infecting ticks that the veld is kept in an infective state, so that any susceptible animal introduced from oversea or elsewhere, is fairly certain to contract the disease. The engorged female, having fallen from a sick or recovered animal, the resultant larvae are capable of conveying the disease should they attach themselves to a susceptible host. In this disease it is presumed that the organism imbibed with the blood drawn from the infected animal goes through a certain development in the body of the female and enters the eggs whilst in process of development in the ovary. It persists inside the young larva and finds its way to the salivary glands, whence it is injected into the blood of the new host.

BILIARY FEVER OF THE DOG.

Another disease, common in Southern Rhodesia, which is conveyed by ticks is Biliary Fever of the Dog. The tick implicated in connection with this disease is the dog tick (*haemaphysalis leachi*), see plate 1, fig. 4. The engorged females of this species are much the size and shape of the common blue tick of cattle, but the body is of a more uniform slaty blue. The method by which this tick carries infection forms one of the most remarkable instances that have been disclosed during the investigation of the transmission of disease by ticks. Like the brown tick, the dog

tick falls to the ground to moult between each of its stages. As with Redwater, the recovered dog is capable of infecting ticks. To convey infection it is necessary for the female dog tick to engorge herself upon a sick or recovered dog. The larvae which hatch from her eggs may feed on a susceptible dog, but they will not give it the disease. The same applies to the nymphs. It is not until the progeny of the infected female reach the adult stage that they become infective. Then if any of them attach themselves to a susceptible dog they may give it the disease. It is to be noted in this connection how far infection may be spread from a single dog without the intervention of any other infected animal. The infected female tick, of which a number may fall from a single animal, lays several thousands of eggs. The larvae hatching from these eggs are probably picked up by a number of different animals, dogs, jackals, and other carnivora, and are carried for two days before they drop off engorged. During these two days the animals carrying the larvae may have travelled a number of miles. The nymphs which hatch from these larvae are again picked up and carried for about four days, before dropping off engorged. The disease conveying adults may thus moult out a considerable number of miles away from the dog that originally dropped the infected females. Were East Coast Fever carried by this method, it would render the arrest of its spread a matter almost of impossibility.

BILIARY FEVER OF EQUINES.

Another well-known disease in this country is Biliary Fever of the Horse, Mule and Donkey. Only one tick has been convicted of carrying this disease, and that is the red tick (*rhipicephalus evertsi*), see plate I, fig. 3, also concerned with the transmission of East Coast Fever. As already pointed out, this tick remains on its host for the first moult, and falls off for the second. This disease is conveyed after the manner of East Coast Fever. If the first two stages are passed on a sick or recovered animal, and after the moult the adult attaches itself to a susceptible animal, the disease is likely to be contracted. It is worthy of note that Theiler has found the organism of this disease in the *zebra*, which is thus a factor in the perpetuation of the disease.

HEARTWATER.

This disease fortunately is not known in Southern Rhodesia, but it occurs in the Cape Colony and the Transvaal, and is responsible for the death of a large number of small stock, not excluding calves. It is conveyed after the fashion of East Coast Fever, by the bont tick (*amblyomma hebraeum*).

PARALYSIS OF SMALL STOCK.

This trouble is also not known to occur in Southern Rhodesia, but is a common affection of small stock in the Eastern Province of the Cape Colony. It has not been definitely proved that it is caused by a tick, but there are strong reasons for supposing that it is due in some way to the attack of the russet tick (*ixodes pilosus*). An article on ticks and animal disease would be incomplete without a reference to the supposed connection between this species and paralysis.

Leaving now the *ixodidae*, there are two species of ticks belonging to another family which deserve mention. The family is the *argasidae*, and comprises ticks of a different form and a different life history to the *ixodidae*. Included in this family are the fowl ticks and tampans. The common fowl tick (*argas persicus*), see plate I, fig. 5, is widely distributed throughout South Africa, and occurs in many other parts of the world. The life history and habits of this species, the one most closely studied, may be taken as typical of the family. To our knowledge of its life history we are indebted to Mr. Lounsbury, the Cape Entomologist. The adults and nymphs of this species live in cracks and sheltered places in the walls and roofs of fowl houses. Here the eggs are laid in comparatively small batches of about twenty to a hundred. The larvae attach themselves to the fowls and remain attached until engorged, a period occupying five to ten days, but usually about five. Dropping off, they seek shelter until they moult and become first-stage nymphs. The ticks now assume habits different from those of the ticks previously mentioned, and instead of attaching themselves for a considerable period to their hosts, they sally forth at night and attack the fowls, filling themselves with blood in the course of a couple of hours, and retiring to their hiding places. After about a fortnight of this life they moult again and

become second-stage nymphs. A further moult occurs after a few weeks, and the adults appear. As with the *ixodidae* the male remains small, but the female imbibes a large quantity of blood and increases in size.

Members of the *argasidae* are easily distinguishable from those of the *ixodidae* to any one who has seen specimens of the two together. The most salient difference is the absence in the *argasidae* of the dorsal shield.

SPIROCHAETOSIS IN FOWLS.

Not only is the fowl tick a terrible pest from the amount of blood it sucks from the fowls and the irritation caused by its attacks, but it has been proved to convey a specific disease of a fatal nature, which is known as *spirochaetosis.* This disease occurs in Southern Rhodesia, being found about Salisbury among other places. The organism is sucked in with the blood from an infected fowl and undergoes development in the body of the tick, being injected into the victim through the salivary glands by the tick at a subsequent feeding.

RELAPSING FEVER IN MAN.

To complete our indictment against ticks in general, there is a disease which affects man North of the Zambesi, which is of the same nature as the Spirochaetosis of fowls, though luckily not so generally fatal in its effects. This disease is known as "Relapsing Fever" and is conveyed by a tick belongina to the family *Argasidae.* The disease is not known to occur in Southern Rhodesia, but the tick that conveys it is common in places. This tick is known in certain parts of the Cape Colony as the Tampan, though this name is also frequently applied to the fowl tick. As it is desirable to have a common name for the pest, however, the name Tampan as used by writers is generally applied to this tick, Its scientific name is *Ornithodorus moubata.* The Tampan is not unlike the fowl tick in general appearance, but it is larger and broader in proportion. Its life history is much the same. Its habits are also similar except that it commonly infests human dwellings rather than fowl houses, and that human beings are very favourite hosts. It is also described

as infecting outspans in sandy regions, where it hides in the sand whilst waiting for a victim. In this disease the organisms ingested with the blood by the female work their way into the ovaries and persist in the young larvæ when they are hatched. It is not however until the larvæ moult to first-stage nymphs that they become infective. If in this stage it feeds on a man capable of taking the disease, it may carry infection. Once infected the tick retains its ability to convey the disease for months. It is even stated that infection will persist over into the third generation of the tick after it has imbibed the infected blood. The writer once permitted a female of this species to feed on his arm. At the point where the bite took place a circular patch of vivid red was formed, about the size of a three penny piece. This persisted until next day and was visible for a week or two afterwards. There was practically no pain, though various writers have reported that the bite is extremely painful.

TICK DESTRUCTION.

Considering the danger to our domestic animals attendant upon the prevalence of large numbers of ticks on the veld and about our homesteads, it is a subject for congratulation that means have been evolved by which these pests can be destroyed. The standard method of destruction, namely, the dipping of our flocks and herds, is too well known to call for more than allusion here. The active principle of an effective dip for ticks is arsenic in a soluble form, and though some may claim that an addition of tar and other ingredients renders the dip more effective, the fact remains that ticks can be destroyed by dipping the hosts in a solution of Arsenite of Soda alone. Dipping for ticks has proved an inestimable boon in parts of South Africa where formerly the pest by its very numbers rendered cattle raising unprofitable.

Leaving the *Ixodidae*, however, we come to the question of dealing with the fowl ticks that infest our fowl houses and the tampans that may infest the "kyas" of our servants or even, under primitive conditions, our own dwellings. It is an unfortunate fact that many of the houses, built of grass and

wood, which are used for fowls in this country are most favourable for the increase of fowl ticks. Whenever possible such structures should be avoided.

In setting up a new fowl-house the greatest care should always be taken to avoid bringing fowl ticks to it on the fowls. It has already been shewn that the only stage in which the tick lives attached to the fowl is the first or larval stage, and that five days is about the period during which it remains. Before allowing fowls access to a new fowl-house they should be kept for one week in crates or wire-topped boxes, in order to allow any larvae that may be attached to complete their feeding and fall off. The boxes or crates should then be burnt to destroy the ticks that have fallen from the fowls. Methods of ridding an infested fowl-house of ticks depend largely on its structure. In the first place any idea of starving the ticks may be abandoned, as they have been shewn to be capable of living for several years without feeding. If the house is a mud and grass one or carelessly built of old wood or similar material, the best and cheapest way is to burn the whole structure and build anew. If, however, it is built of brick or well made of iron and wood, recourse may be had to the use of paraffin oil and hot coal tar. Paraffin oil is a powerful and penetrating enemy of ticks, as it is indeed of insect life in general. The oil should be injected into all cracks and crevices in the walls and roof. The perches should be removed and cleaned, and special attention paid to any sheltered spots that may be found where the perches rested, as these are favourite haunts of the ticks. The dressing of cracks and crevices in the fowl house with hot coal tar is a sound method of protection. Destructive methods, whether of burning or cleansing, should in every case be accompanied by isolation of the fowls for a week in crates as described above in order to rid them of larvae. If the fowls are badly infested with the larvae the spots may be dressed with turpentine or oil, but in the usual way the end is best served by isolation and the burning of the crates.

With regard to the Tampan, severe infestations of dwellings are mostly confined to "daga kyas," which do not admit of efficient treatment. In some parts the natives are in the habit of smoking out their "kyas" at intervals to destroy

these ticks, but the method is not thoroughly effectual and affords at the best but temporary relief. It must be remembered that the tick is not only an irritating parasite, but is a potential enemy of human life and health. Infested huts should in every case be destroyed by fire and the consumption rendered as thorough as possible.

EXPLANATION OF PLATES.

PLATE I.

Fig. 1. The Brown Tick (*Rhipicephalus appendiculatus*), male, dorsal aspect.
„ 1a. Brown Tick, male, ventral aspect.
„ 1b. Brown Tick, female, unfed.
„ 1c. Brown Tick, engorged female.
„ 2. The Blue Tick (*Margaropus decoloratus*), male, dorsal aspect.
„ 2a. Blue Tick, male, ventral aspect.
„ 2b. Blue Tick, engorged female.
„ 3. The Red Tick (R. evertsi) male, dorsal aspect.
„ 3a. Red Tick, male, ventral aspect.
„ 3b. Red Tick, unfed female.
„ 3c. Red Tick, engorged female.
„ 4. The Dog Tick (*Haemaphysalis leachi*) male, dorsal aspect.
„ 4a. Dog Tick, male, ventral aspect.
„ 4b. Dog Tick, engorged female.
„ 5. The Fowl Tick (*Argas persicus*), nymph, dorsal aspect.
„ 5a. Fowl Tick nymph, ventral aspect.
„ 5b. Fowl Tick, adult dorsal aspect.
„ 5c. Fowl Tick adult, ventral aspect.

PLATE II.

Fig. 1. Brown Tick (*R. appendiculatus*) larva, greatly enlarged.
„ 2. Brown Tick nymph, greatly enlarged.

PLATE III.

Female Tick shewing clusters of eggs.

The Rhodesia Agricultural Union.

THE PRESIDENTIAL ADDRESS.

Space forbids reproduction of discussions at length, but the opening address by the President, Mr. J. A. Edmonds, giving a brief and lucid exposition of the progress of agriculture during the year, is of such wide interest that it is given verbatim :—

My first and most pleasant duty is to welcome you all to this the seventh annual Congress of the Rhodesian Agricultural Union, and particularly to extend that welcome to the delegates of the affiliated farmers' associations, who have come, in many instances, from remote parts of the country, actuated by the laudable motives of support to our Union and the advancement of the land we live in. We also have to extend a hearty welcome to the members of the Government and the Agricultural Department present here to-day. We, in common with the rest of the world, realise that our sole hope of competing on equal terms with other portions of the Empire in the production of the necessities of life, lies in taking advantage of the knowledge and discoveries of scientific agriculture and stock raising, and it is chiefly to attain this end that the efforts of the Director of Agriculture and his staff are directed. In reviewing the position of the farming industry during the past year—and since we last met in Congress—the following facts stand out in a noticeable degree :—

1. The large increase of arable land, resulting in a far larger production of maize.
2. Freedom from the plague of locusts.
3. The increase in the numbers of cattle and the improved methods in winter feeding, by means of utilising the hay of the country.
4. A better understanding with the mines, particularly with regard to direct contracts for meal and grain supplies.
5. The opening up of additional markets for farm produce.

6. The increase in the number of private dipping tanks in use.
7. The growing desire to construct farm fences.
8. The probability of the building of additional railways to open up new farming and mining areas.
9. An increase in the number of irrigation schemes.
10. Better facilities for obtaining farm labour from the northern territories, through the agency of the Rhodesian Native Labour Bureau.
11. The advancement of the co-operative principle amongst farmers.
12. The improvement in educational facilities to meet rural requirements.

Perhaps the most important feature of the year, so far as we, as an agricultural community, are concerned, is the number of new settlers who have taken up land, and thrown in their lot with Rhodesia. This is an increase in the best asset any colony can obtain. In conjunction with this pleasing feature in the development of our country, there has been a great and noticeable advance in our sister industry, that of the mines, resulting in additional capital for mining development, and the increased interest shown by South African and London capitalists in the great mineral possibilities and resources of Rhodesia. These two features have resulted in a substantial advance in the value of farm lands, creating a natural desire for a better and closer definition and understanding of the respective rights and privileges of the farmer and mines. Well, gentlemen, I have always maintained that this Union should be regarded as the farmers' parliament, and that its findings on all matters on which it can justly and rightly express an opinion should go forward to the Government of this country, bearing the full weight and importance of a most responsible and representative chamber. Should this be the case, we may safely assume that our recommendations would receive the gravest consideration, and would, where possible, be put into effect. From the force of natural circumstance in the present development of Southern Rhodesia and the distribution of the population, we cannot expect any adequate or direct representation in the Legislative Council. It therefore behoves us, with the increasingly important questions affecting us as farmers looming up so closely, to support this Union to the

best of our ability, to preach the possibilities of its paramount importance to our neighbours, and to do our best to make it the important lever to lift into prominence all our legitimate and just demands.

The increase in the number of African Coast fever outbreaks during the past few months is the gravest matter farmers have had to face during the past year. Discussions and meetings have been generally held all over the country in connection with this dread scourge, and it is satisfactory to note that a committee is to be shortly appointed to collect evidence on the situation, to advise on the best policy to adopt in order to restore confidence in the pastoral development of this territory. This congress will provide a fitting occasion for an expression of opinion on this important subject. The question of education has been gone into by the committee appointed for that purpose, and a report will be submitted to you during our session. During the past year several new district farmers' associations have been formed and the formation of others is under consideration. The thanks of the Union are due to Mr. Hull, who represented Rhodesia at the Inter-colonial Agricultural Congress held in Natal. At the Irrigation Congress held recently at Potchefstróom we had the advantage of being represented by our Vice-President, Mr. Fletcher, and the Director of Agriculture, Dr. Nobbs, who attended on behalf of the Government. The appointment of an irrigation engineer, the starting of a stud stock farm, and better terms to encourage fencing are all recent evidence of the importance attached by our Government to the proper fostering of the farming industry. Many important matters are coming up in the agenda for your earnest consideration. The Secretary will present his report and you will be called upon to elect a president and two vice-presidents. You have seriously to consider the question of the Union finances. In conclusion I would urge you to use the opportunity of this congress to deal in the most efficient way with the business before us, resulting in the advance of the farming interests and the good of the country we have adopted as a home. (Applause.)

Mr. R. A. Fletcher, in moving the adoption of the President's report, extended a hearty welcome to the delegates from the people of Bulawayo and the farmers of Matabeleland and particularly those in the Bulawayo district,

The Butter Classes at the Bulawayo Show.

By J. C. JESSER COOPE, F.C.S., N.D.D.

The following notes on the butter exhibits at the Bulawayo Agricultural Show may be of interest to some readers. The Agricultural Society decided that this year the butter exhibits should be judged by points, and a score card showing points awarded should be attached to each exhibit. I was asked to undertake the judging; the following were the maximum points arranged :—

General appearance	10
Colour	10
Moisture	10
Texture	20
Flavour and aroma	50
	100

The general appearance of the butter judged was indifferent. This deserves the consideration of makers, who are trying to establish a good name for their produce. In no case had the butter been hand printed. Making up butter with an attractive appearance is a very important part of the art of butter making, for good shape and colour, neat and striking appearance increases the market value of butter, especially where there is competition.

It will be found that well-shaped oblong blocks are generally the best. A one-pound block should not be more than six inches long; a fancy design may with advantage be printed on top surface with one of the Scotch hands. This hand printing is very simple to do, takes little time, improves the appearance of the butter, shows up the colour to advantage, and is also valuable as a trade mark.

As was to be expected at this time of year, most of the butter exhibited was lacking in colour. What is required in the colour of butter is that it should be even throughout, and of a tinge pleasing to the eye. The principal faults in the colour of the butter exhibited were :—Mottling, due probably to the use of over-ripened cream. Streakiness, due possibly to (a) cream having been ripened in a bright light; (b) over-churning; (c) over-washing; (d) insufficient washing; (e) bad management of butter grains on worker; (f) uneven salting, or the use of bad quality salt.

The moisture in butter should be in a very finely divided state; no large drops should appear when butter is pressed by the Scotch hands. There should be no trace of butter-milk. Much of the butter examined fulfilled these conditions, but some of the exhibits, on being cut, showed collections of large drops; this was due to bad salting; the salt had been applied unevenly, and an excess of salt in places had caused moisture to collect into large drops. Other samples on being opened lost a considerable amount of moisture. This was probably due to the butter when put up containing a large percentage of moisture, and then, being held at a very low temperature, the consequent contraction causing the moisture to collect in the centre of the butter, when, on cutting, the water escaped. In Australia and New Zealand, where large quantities of butter are exported in cold storage, it has been found unwise to incorporate more than 10 to 12 per cent. of moisture in butter that is to be frozen.

The texture should be distinctly granular, even and close. The butter grains of some of the exhibits were rather too small, even for butter made in cold weather. As small butter grains hold up a large percentage of moisture, they require a considerable amount of working, on the butter worker, to express this moisture. There was evidence in some of the exhibits of over-working, whereby the grain had been damaged, and the butter rendered soft, resulting in loss of flavour and quality. Butter grains, when taken from the churn, should be round and even, and generally about the size of No. 4 shot. In this state the unnecessary moisture is easily got rid of on the worker without damage to the grains. It is of considerable importance, especially in hot weather, to remove the grains from the churn in a condition that

requires as little manipulation on the worker as possible; therefore, grains from which the moisture is easily expressed should be aimed at.

The flavour of one sample of butter was excellent. It was sweet and nutty, evenly salted, free from oiliness or taint of any sort. This butter is undoubtedly made from milk of cows carefully fed, whose ration probably includes a large quantity of succulent green food. I was somewhat surprised to find such fine flavoured butter at this time of year, proving as it did that Rhodesia can produce butter of the highest quality throughout the year.

A lack of care in feeding and management of the cows was noticeable amongst some of the other exhibits. In one case there was a distinctly unpleasant flavour, probably due to some food or herb eaten by the cows. Uneven salting damaged the flavour of some, and in one case salt containing a considerable amount of grittiness, and which was not readily soluble, had been used. In some of the exhibits a butyric acid taint was noticeable, most probably due to over-ripened cream, which had been at a low temperature, and had not been stirred sufficiently, so that portions of the cream would lack free oxygen, without which the best flavoured cream and resulting butter cannot be obtained. Cream should be ripened in a pure fresh atmosphere and stirred occasionally, so that no portion should lack contact with fresh air. With the use of separators, this matter requires more attention than was necessary when the shallow pan system of cream rising was general. Cream should not be ripened in too bright a light.

Exhibitors might, with advantage, pay more attention to the method of packing and showing their exhibits. Chip wood boxes might be used with advantage for packing. Such boxes cost only the fraction of a penny each, protect the butter in transit, and enable the butter to be easily handled. It would also be an improvement if each exhibit were shown separately on a clean butter board—this would not only assist the judge, but also render each exhibit more attractive when viewed by the public.

In the case of one exhibit, I noticed that a large quantity of butter had been sent; I presume for exhibition. The

whole consignment was packed in a most suitable case, and done up in good butter paper, and had this exhibit had to compete against exhibits of similar quantity, little fault could have been found in the manner in which it was packed, but as the competition was for exhibits of 2 lbs. only, of fresh butter, it was necessary for 2 lbs. to be taken haphazard from this large exhibit, and the whole exhibit judged on these two pounds. In this case the exhibitor would possibly have found it of advantage to have selected 2 lbs. for the judge's inspection, and packed this small amount in a suitable manner,so that it might be put on exhibition on as favourable conditions as the exhibits of any other competitor.

Extracts from the Annual Report of the Department of Agriculture and the Veterinary Department.

As these Reports, laid on the Table of the Legislative Council and issued as a Blue Book are not readily accessible to farmers the following passages are republished for general information:—

The year commenced well for farmers all over Rhodesia, with the copious rains, heavy crops, and stock in good condition. This promise was borne out by the harvest, grain of all sorts being abundant, and in some instances far above the average. Prices were somewhat reduced, but competition between consumers maintained them at a profitable level. Rumours of shortage, of market manipulations, of export schemes, and of reduced railway rates affected the market at different times, but a general tendency is observable towards a uniform and fair price, with less speculative fluctuation than was usual in the past. Supply and demand are gradually adjusting themselves, and the business is becoming less speculative and more reliable. The existence of a co-operative society dealing in mealies is exerting a far-reaching influence in this direction, which is greatly to the benefit of all parties.

Amongst exports for the year, certain items are noteworthy, such as:—

	lbs.	£
Hides, ox and cow ...	151,765	4,908
Skins, sheep and goat ...	85,563	2.804
Kaffir corn	1,413,473	4,090
Onions	41,123	345
Potatoes	216,793	1,300
Tobacco, manufactured ...	190,822	11,002
Wood	...	947
Mealies	2,288,453	6,023
		31,419

The above list, though not exhaustive indicates the nature of the main agricultural products of which at certain seasons we had a surplus, but it is by no means indicative of

our actual productive capacity, and is but a small offset against our heavy toll of purchases of foodstuffs from without.

THE FARMERS' ASSOCIATIONS dotted about the country, and increasing in strength and numbers, form a useful organisation for obtaining expression of local public opinion, and a convenient medium for communicating between the farmers and the Government. In several cases there is a very desirable tendency being displayed to make the meetings of these bodies an opportunity for the exchange of useful ideas on farming topics by the reading of instructive papers and discussion of pet themes, instead of merely utilising the gatherings for expressing sentiments, complimentary or otherwise, on local affairs.

CROPS.—Arable farming in Rhodesia presents a curious anomaly. While a great variety of crops are already known to succeed, not everywhere, but in suitable situations and in different localities, yet there is to-day only one staple crop —the mealie. No doubt the simplicity of its cultivation, the sure demand and the comparative certainty of a crop combine to render the maize the beginner's sheet-anchor. In a country of summer rainfall, with considerable possibilities of irrigation and winter cropping, and protected from competition by a great length of railway, there is every reason to anticipate the cultivation of a wide variety of crops.

OTHER CROPS.—Apart from twenty-four different sorts which upwards of one hundred farmers are now growing on an experimental scale in all parts of the country in conjunction with the Department, there are a variety of crops which are coming into use, partly on their own merits and partly for the purpose of rotation. Besides the old established crops—pumpkins, beans and ground nuts—one hears increasingly of the cultivation as field crops of potatoes, onions, millets, oat-hay, wheat sweet potatoes, and in a few instances, and quite successfully, rape buckwheat, loofa and calabash pipes. No one of these will be as widely grown as mealies, yet together they might go far to give a change to land on which that crop has been grown for some time. The demand of the mines for vegetable food in quantity and at low prices should render many of these crops remunerative.

Besides these crops, which can be grown on average mealie land, we have a number of others, demanding rather different conditions. Chief amongst these is tobacco, which, after various vicissitudes, is coming to take its proper place as the crop of the specialist who lays himself out to produce a high-class article, the only form of tobacco for which a demand exists at profitable prices. | Tobacco is essentially an "industrial" crop grown for the manufacturer. Another such is broomcorn, the successful introduction of which has certainly been one of the events of the year. The manufacture of brooms and wisps on commercial lines by Mr Speer, of the Mutambarra Mission, Umtali, has proved so satisfactory that over forty acresof broomcorn are being sown this season. There is good reason to anticipate a much increased acreage in the future and a considerable manufacture resulting therefrom.

Another crop which is coming to the fore, after many years of experiment and doubt, is coffee in the southern portion of the Melsetter district, where over twenty farmers are now growing coffee for sale, although as yet they have only some 40,000 trees of all ages. There are possibilities of a much greater extension of this crop within the region where it is now known to thrive.

Linseed may also be mentioned as a crop which is growing in popularity and which yields well. It is valued for the seed, used chiefly as a calf meal, the labour difficulties rendering the flax at present an unprofitable proposition.

Other industrial crops, notably the fibres—such as jute, sisal and Mauritius hemp, New Zealand flax, ramie, and native fibres and rubber—are still in too early a stage of experiment to allow an opinion to be expressed, but their possibilities are not being overlooked.

Cultivated grasses promise, curiously enough, in such a wonderful country for grasses as is Rhodesia, to serve an invaluable purpose for superior "hay" and for winter green feed. Paspalum dilatatum is already established on many farms, while a number of others are giving good promise experimentally.

The European cereals—wheat, barley, oats, rye, and barley wheat—are, as irrigation extends and the possibilities of our wet vleis are realised, coming to the fore, and giving pros-

pect of proving highly remunerative, although much experimental work is necessary before the problems of growing them to perfection are satisfactorily solved.

LABOUR.—It is a prime essential for the country that labour shall be abundant. As it cannot for many years be skilled, and constant supervision is necessary, it must be cheap. Considerable anxiety existed at one time as to the provision of an adequate supply of labour for the farmers. This has happily been solved by the introduction of northern boys brought down under contract and protected by Government supervision. But for this timely step there can be no doubt that agricultural progress would have been seriously jeopardised. Very satisfactory results have followed. It has been abundantly shewn that farm labour is not too severe nor in itself objectionable, yet local native labour is virtually unobtainable for that purpose.

AGRICULTURAL CO-OPERATION is making a successful beginning as an independent movement on the part of the farmers with a minimum of State aid or State interference. The initial difficulties inseparable from such enterprises have to be met and overcome, and on this subject the pioneer undertakings have to gain their experience, making it comparatively easy for others to follow. It is really remarkable that co-operative effort should have succeeded so far as it has in so sparsely populated a country, from which it is reasonable to conclude that when the land is fully occupied such enterprises will become one of the leading economic factors of our agricultural commerce.

IMPORTATION OF STOCK.—With a view to safeguarding Rhodesia against the introduction of lung-sickness through the importation of cattle from the Southern States, certain certificates are, according to our regulations, required to be signed by the exporters guaranteeing amongst other things that the stock in question have been bred on the farm from which they are exported, and that to their owner's knowledge there has been no opportunity of their having contracted lung-sickness. Grounds for suspecting that in certain cases these declarations were signed without due regard to facts, led to the appointment of an examiner of stock, whose special duty is to satisfy himself on this point, and otherwise to see that exportations of stock from Cape Colony and the Orange River Colony are in order. The officer ap-

pointed has been instrumental in preventing several direct infringements of the law, thus amply demonstrating the necessity for this control. It is hoped that the measures now adopted will lead to the prevention rather than the discovery of such irregularities, and will also facilitate, expedite, and simplify the procedure connected with the introduction of live-stock, while still protecting this country from a scourge of which it is at present happily free.

During the period under review 2,263 head of horned stock were admitted from the Southern Colonies, 28 head from oversea and 11,568 from across the Zambesi.

SCIENTIFIC RESEARCH.—The duties of a Department of Agriculture are various and, apart from administrative routine, include the application of the methods of scientific enquiry to the elucidation of economic problems of direct interest to farmers. This entails the accumulation of information by the process of patient systematic experiment to ascertain what crops of temperate and sub-tropical regions may be introduced here and the best modes of cultivating and treating them, and to investigate diseases of live-stock with the hope of finding preventive or curative treatment. Further, there is a great field of research in the breeding and raising of stock and the production of satisfactory cross-bred or graded cattle of types suitable to our requirements, whether for beef, milk or trek. In fact it is the sphere of the Department to study everything which will enable us to turn the natural advantages of the country to the best account. Some work entails outlay, and cannot be directly remunerative. It also takes time. The private farmer cannot be expected to undertake it, and it is fitting that the Government should provide means for research work. Something in this direction is already being done along various lines, botanical, chemical, entomological, veterinary and agricultural in the restricted sense of that term.

EXPERIMENT STATION, GWIBI. — The Department already possesses one admirable site for such purposes at the Gwibi, some eighteen miles from Salisbury, and this place, originally intended for tree-planting purposes, has been retained for experimental use, though last year it was only possible to conduct experiments on a very limited scale, to break up land in view of possible extension of operations, and to prevent work done in the past from being wasted.

The establishment of the farm consists of a foreman and an average roll of about sixteen native labourers, while twenty oxen comprise the draft animals. In view of the general difficulty experienced by farmers in procuring good seed maize true to type, Mr. Mundy has arranged that the land should be planted with selected seed of approved varieties, with the object of raising pure maize seed for sale to farmers. Two hundred acres are now under crop, of which 110 acres are occupied by blocks of the following varieties of maize:—(1) Rhodesian Hickory King, (2) Salisbury White, (3) Boone County, (4) Natal Hickory King, (5) Iowa Silver Mine, (6) Champion White Pearl, (7) Hickory Horse-Tooth, (8) Yellow Hogan, (9) Eureka Field Corn. The last five varieties, comprising three "whites" and two "yellows," are more or less new to this country. They are rapidly gaining favour in other parts of South Africa, and their introduction here may prove beneficial. In addition, the following crops have been sown for the double purpose of providing winter feed for stock, and for raising reliable seed for sale:—Velvet beans *(Macuna utilis)*, cowpeas *(Vigna catjang)*, kafir beans *(Vigna catjang var.)*, Boer manna *(Setaria italica)*, Japanese millet *(Panicum crus-galli)*, teosinte *(Euchloena mexicana)*, teff grass *(Eragrostis abyssinica)*, pumpkins, wheat, linseed, and paspalum. A nursery has also been established for the propagation of Mauritius hemp *(Fourcroya gigantea)*, in order that this crop may be planted and tested on a commercial scale. The forestry side of the work has been relegated for the time being to a minor position; only a sufficient number of trees being raised for the planting of a combined avenue and shelter belt. The buildings consist of two brick huts, an implement shed, and native huts.

BOTANICAL EXPERIMENT STATION.—Arrangements have also been made for conducting experimental work on a small scale, under the immediate supervision of the technical officers at Salisbury. To this end the old experiment station on the Nursery Farm, Salisbury, has been given up, and a similar though more up-to-date station established, in close proximity to the Agricultural Laboratories. The advantage of this scheme are two-fold, first that the experiments will be more accessible to farmers visiting Salisbury (and it is hoped that they will not fail to take full advantage of this), and, secondly, that the work can be carried out more systematically under close personal supervision. An area of thirteen

acres is divided into blocks of various sizes, and experimental sowings of different crops thought suitable to the country have been made. This botanical station will also be a centre for the work of introducing newly discovered or newly created varieties of forage crops, cereals, pasture grasses, etc. Plant breeding with maize and wheat will also be initiated, and the seed thus raised will in time be distributed to experiment farms and to private farmers. The establishment at present consists of a white foreman and about fourteen native labourers, while draft animals comprise six oxen and two mules. From the old nursery a stock of that valuable winter grass, *paspalum dilatatum*, has been distributed to farmers at the nominal price of 5s. per thousand slips, and during the season, up to the 31st December, 50,000 slips had been sent out.

CO-OPERATIVE EXPERIMENTS.—The advantages derived from a systematic scheme of co-operative experiments are now recognised throughout the world, and, in that it is the means of collecting the greatest amount of information in the shortest possible time, it is of particular value to a country such as Rhodesia, where so little is known of the agricultural possibilities of the different soils and districts. Since the Agriculturist, Mr. Mundy, entered upon his duties, there has been a notable extension of the work of conducting experiments in co-operation with individual farmers, mainly along the lines of issuing parcels of seed of cereals, forage crops, and grasses, and, while it is too early yet to look for reports, there can be no doubt, in view of the eagerness of farmers to take advantage of these opportunities, that good results must soon follow. To date, rather more than one ton of miscellaneous seeds have been distributed among eighty-five farmers. The largest demand has been for the following seeds:—Iowa silver mine, hickory horse-tooth, champion white pearl, yellow hogan, eureka field corn; the following grasses:—tall fescue, paspalum, rescue, guinea and teff, also burnet and sheep's parsley; peanuts, castor-oil, linseed, rape, chicory, rye, Chevalier barley, Nepaul barley; the following oats:—Algerian, Old Cape, New Zealand, and Sidonian; and the following wheats:—Bobs, Gluyas early, Klein Koren and Swaartbaard.

FORESTRY.—The possibilities of systematic and extensive tree planting, and of the conservation and exploitation of

the forest wealth of Rhodesia, demand earnest consideration. The distribution of trees for afforestation purposes to farmers at 1d. apiece has proved a much greater success than previous experience gave reason to anticipate. Up to 31st December orders have been booked, and for the most part supplied, to the total number of 20,733 trees. Free issues of trees to the number of 1,200 have been made, while, in addition, a few hundred mulberry cuttings have also been disposed of. While tree planting is in its infancy, local prejudice counts for a great deal, and naturally the greatest demand has been for trees which are already known to grow more or less freely. Among these may be mentioned, beefwood (Casuarina suberosa), lemon scented gum (Eucalyptus citriodora), and Eucalyptus saligna. The demand justifies the extension of the work another year. The distribution of trees was carried out during the year under exceptional disadvantages. Not only was the site of the nursery transferred, involving the issue of trees from both places, but the whole management had to be thrown at short notice upon the Agriculturist, in addition to and necessarily to the disadvantage of his own proper avocations. It is hoped shortly to rectify this matter. In view of the long journeys which seedlings have to undergo by train and wagon, and the uncertainty of securing favourable planting weather on arrival at their destination, it is intended in the future—even though at an enhanced cost of production—to transplant seedlings into tins as far as possible.

TECHNICAL EDUCATION IN AGRICULTURE is wanted not only for the boys growing up in the country, and for young fellows coming out raw from Home, but for our own practising farmers, the best of whom are the first to admit the need. The time is hardly ripe for an Agricultural School, but there is need for courses of instruction to farmers, and it is hoped that this matter may be taken up shortly.

With regard to the peculiar circumstances of Rhodesian agriculture, it must be remembered that before much can be taught there is very much to be learnt, and that science stands as yet only at the very threshold of this subject; and, further, that the first and most pressing need is to give facilities for sound primary and secondary education throughout the country, if possible, with sufficient agricultural bias and nature study as will give children fated to spend their lives

in remote districts an intelligent interest in their environment. When schemes of this sort are under consideration, the generous bequests for the benefit of the cause of technical education in Rhodesia must not be forgotten.

GAME AND VERMIN.—Game is abundant, and in many instances interferes with farming operations, eating crops and breaking fences. Herds of the larger antelope and wild ostriches are the worst offenders in this respect. These also attract lions, leopards and other wild beasts, which thus come into contact with domestic animals, and the annual loss of cattle, donkeys, mules, goats and sheep from this cause has been considerable, so much so that serious complaints have been made during the year.

With a view to lessening these losses, rewards are offered by Government for the destruction of certain wild carnivora. The following is a return of animals for which rewards have been paid in this connection during the course of the year. This, however, by no means represents the number actually killed, as many people do not apply for the rewards.

	Head	£	s.	d.
Lion	53	159	0	0
Leopard	134	134	0	0
Cheetah	26	26	0	0
Wild Dog	35	17	10	0
Crocodile	14	7	0	0
Totals ...	262	343	10	0

The addition of hyaenas to the list of animals for the destruction of which rewards are paid is under consideration as, though useful as scavengers, they are bold marauders, and occasionally attack human beings, and both large and small stock. Very general complaints are made of damage caused by baboons and wild pigs, and the annual loss from their depredations must in the aggregate amount to a considerable sum.

PURCHASE OF BREEDING STOCK.—The scheme lately inaugurated under which this Department undertakes to purchase stud animals for farmers meeting all risks in transit, including the tuberculin test, and giving easy terms of repayment by instalments, has been well patronised, and the

purchases made seem to have given much satisfaction. Although it has only been in force since the 21st June, 1909, ten applications in all have been received to the end of the year for 64 head of cattle, representing a value of some £846, and including the following breeds:—Friesland, Africander Lincoln Red, Aberdeen-Angus and Hereford. Berkshire, Yorkshire and Large Black Pigs have also been applied for. This is quite satisfactory, for necessarily there is some hesitation in trying a new venture of this sort, and it is better to commence gradually and gain experience than to begin on too ambitious a scale. The arrangements made for procuring stock are entirely adequate, and we may look forward to this becoming a useful branch of departmental activity. Since the end of the year under report, it may be mentioned that a number of further applications have been received.

EMPLOYMENT.—It is a noteworthy thing that in a growing and prosperous country young men should have so much difficulty in obtaining employment. Most farmers, well established, need assistants, while new comers, before taking up farms, do well to look round and gain some local experience before selecting land. Yet it is not always easy to find suitable men for the former, or openings for the latter. Lists of vacancies and of applicants for posts are kept, but, as applicants, however ready to seek help, very seldom take the trouble to inform the Department when suited, it is impossible to say to what extent these lists have proved useful. During the year there were 64 applications for positions on farms as managers, assistants or pupils, and 19 enquiries by farmers for men to fill these positions.

CONSTRUCTION OF DIPPING TANKS.—Systematic and regular dipping is slowly but steadily gaining in public favour, and will no doubt continue to do so as the benefits arising therefrom come to be more fully realised. During the year, 17 tanks have been put up by farmers, who receive a grant in aid equal to one-half the cost, but not exceeding £50 in any one instance.

TRYPANOSOMIASIS.—Trypanosomiasis of the domestic animals,, commonly known as tsetse fly disease, received much attention from the Department, and bulked largely in the discussions of the various Farmers' Associations through-

out the country. The subject has been fully dealt with in departmental reports, and it is unnecessary here to give more than a resume of the position. Fly disease has been known to exist in the country for a considerable period; the earliest records refer to the presence of tsetse flies and the disease transmitted by them to domestic animals. The disease had until recently always been regarded as the same type as the Nagana of Zululand, and has never been known to exist in the Territory except as the result of contact with tsetse flies. After rinderpest it disappeared, but during recent years it has gradually re-appeared in some of the old belts, chiefly in the Hartley, Lomagundi and Sebungwe districts. In Hartley district the mortality during the year was very considerable. Accurate figures are not available, as many animals shewing symptoms of illness were at once disposed of. The increase of the disease in this district is due, not to any extension of tsetse fly areas, but to the large increase in the number of cattle employed in connection with the mining industry, and to a large number of farms having been occupied in or near the fly belts. In the Lomagundi district disease as a result of infection contracted in the local fly belts, is uncommon, because the number of cattle in the district is not large and the owners know the fly belts and avoid them. Cases are frequently seen in cattle imported from North-Eastern Rhodesia. In Sebungwe district, which is practically uninhabited by Europeans, very little is known of the extent of the fly belts, and but one outbreak of the disease was recorded during the year. In Marandellas district an outbreak of disease occurred in May on the farm "Lilliefontein." This was first suspected to be Coast Fever, and a strong force of police was despatched to take charge of the cattle on this and adjoining farms. The disease was diagnosed by the Department as Trypanosomiasis, which was confirmed by Dr. Theiler, and after some months of quarantine and observation the police were withdrawn and quarantine removed. A veterinary expedition, contributed to by all the Southern Colonies, is now investigating the disease in Portuguese East Africa. Independent observations and experimental work are being conducted by the Department but no definite conclusions have as yet been arrived at. So far, all our observations shew that the type of Trypanosomiasis which exists in Southern Rhodesia is conveyed by tsetse flies only. One instance in this connection

may be given. The "Lilliefontein" cattle contracted infection in the Hartley district and were removed to the farm before any symptoms of the disease were noticed. Subsequently seven head died and two recovered, but no case of disease has occurred amongst the other cattle on the farm with which they had come in contact.

REDWATER.—Although Redwater (Texas Fever, Piroplasmosis Bovis) is enzootic in Rhodesia, it causes considerable loss amongst cattle imported from the Southern Colonies and over-seas. Several lots of valuable animals were imported during the year from Britain and East Friesland; some were inoculated, others were not. The mortality from Redwater contracted by inoculation and natural infection has been considerably over 50 per cent. In one case, out of 14 Red-poll bulls and heifers only three survived the first attack of Redwater, and the secondary reactions which are now proceeding will result probably in further loss. Locally-bred cattle, especially calves, suffer to some extent also, and, whilst the mortality is not as a rule serious, the effects are severe, natural growth and development being considerably impeded. It is proposed to devote some attention during the coming year to this subject, as it appears that we have a different type of disease to deal with than exists in the other Colonies, and a special effort will be made to find some method of treatment or preventive inoculation which will minimise the mortality and encourage cattle owners in the importation of well-bred stock.

CALF DISEASE.—This disease, which is of the type described by Nocard in Ireland, has again been the cause of considerable mortality, especially in herds where cows are used for dairy purposes. Very few owners have reported outbreaks, and the Department frequently hears of serious losses when it is too late to do anything.

The results of medicinal treatment are not satisfactory, except in cases of mild infection. In severe cases, the lesions in various organs, particularly in the lung form of the disease, are such as to render the action of any agent hopeless. The only method by which the disease can be combated is prevention. The measures which should be adopted have been published on two occasions in the "Agri-

cultural Journal," and it is unnecessary for me to again record them.

RABIES.—Ten suspected cases of Rabies were reported during the year, as compared with 33 during the previous year, the affected districts being:—

Bulawayo	1 dog.	
Salisbury	2 dogs.	
Mrewa	1 dog.	
Mtoko	1 dog.	
Victoria	1 dog.	2 mules.
Belingwe	1 dog.	
Mazoe	1 dog.	

The method now in practice of confining all dogs within a fixed radius of the outbreak for a period of six weeks, is more satisfactory than the old system of indefinite muzzling. Dog owners, both native and European, comply most readily with the present regulations, whereas under the old order dogs were only muzzled where there were any suspicion of the approach of police or other officials.

DISEASES IN SHEEP.—Malarial Catarrhal Fever or Blue Tongue, which exists chiefly in Inyanga, Umtali and Melsetter districts, have not been prevalent as in former years, due probably, in Mr. Jarvis's opinion, to the evolution of a more resistant type of sheep. The Inyanga Estate sheep are reported to have had greater freedom from disease, due, it is thought, to protective inoculation by Dr. Theiler's method. The Government Veterinary Surgeon, Umtali, made an extended tour through the Melsetter district during the month of August, and reported a very heavy mortality amongst sheep from wireworm and necrosis of the lungs. For the former, many remedies have been tried, but the results have been unsatisfactory, due, it would appear, to the lack of regular attention and systematic dosing, and failure to realise that a change of veld is just as necessary as medicinal treatment of affected animals. A few cases of Fluke disease have been reported, but the general conditions in Rhodesia do not appear to be favourable to its propagation. The liver tapeworm, known as Stilesia Hepatica, is very common, and is generally associated with various para-

sites of the alimentary tract. It has frequently been found in the livers of stembok and duiker.

HORSE SICKNESS.—The mortality during the season 1909 was very heavy, especially amongst horses. It is impossible to obtain accurate figures as to the mortality amongst inoculated mules, but it may be taken for granted, that no serious mortality did occur, otherwise we would have had many complaints and demands for compensation, or the return of inoculation fees. During the year 696 mules were inoculated with material supplied by the Government Veterinary Bacteriologist, Pretoria, with a direct loss, as the result of the process, of 50 animals.

Farms and Farming in Rhodesia.

THE INSIZA DISTRICT.

By H. GODFREY MUNDY, Agriculturist and Botanist.

The Insiza District is often looked upon as one of the finest mixed farming districts of Matabeleland, yet in spite of this fact, recently compiled statistics show that the number of resident farmers is one short of fifty, of whom a third are newcomers within the last two years. The district comprises an area of 4,000 square miles, or approximately 2,560,000 acres, of which 150 square miles are occupied by Native Reserves, and lies partly on the granite and partly on formation, the older established farms being almost without exception situated on formation, though many of the new settlers have taken up granite veld, which has hitherto been looked at askance, except for ranching. The shape of the district resembles that of a pear, with the thick end to the north. It is bounded on the north by the Bulawayo-Salisbury Road, east and south-east by the Doro Range and the Bembesi River, which flows into the M'zingwani, and on the west by the M'zingwani River and Edkin Road. The railway line from Bulawayo to Salisbury passes along the northern boundary, the main halts being Bembesi, Insiza, Shangani, and Somabula Siding, while the Insiza station is eighteen miles from Fort Rixon, which may be termed the centre of the district, and which is the headquarters of the Native Commissioner and the local B.S.A. Police.

The formation area may be said to extend from Insiza station on the left of the river of that name to Kildare Farm, when a break of granite occurs for ten miles to near the old Devon and Grant mines. Here the formation again comes in and continues southward to the Native Reserve between the rivers M'zingwani and Inzisa, while on either side of this gold belt the granite veld encroaches. To the north-east the Somabula Flats stretch out in a series of undulations as far as the eye can reach from the head waters of the Shangani

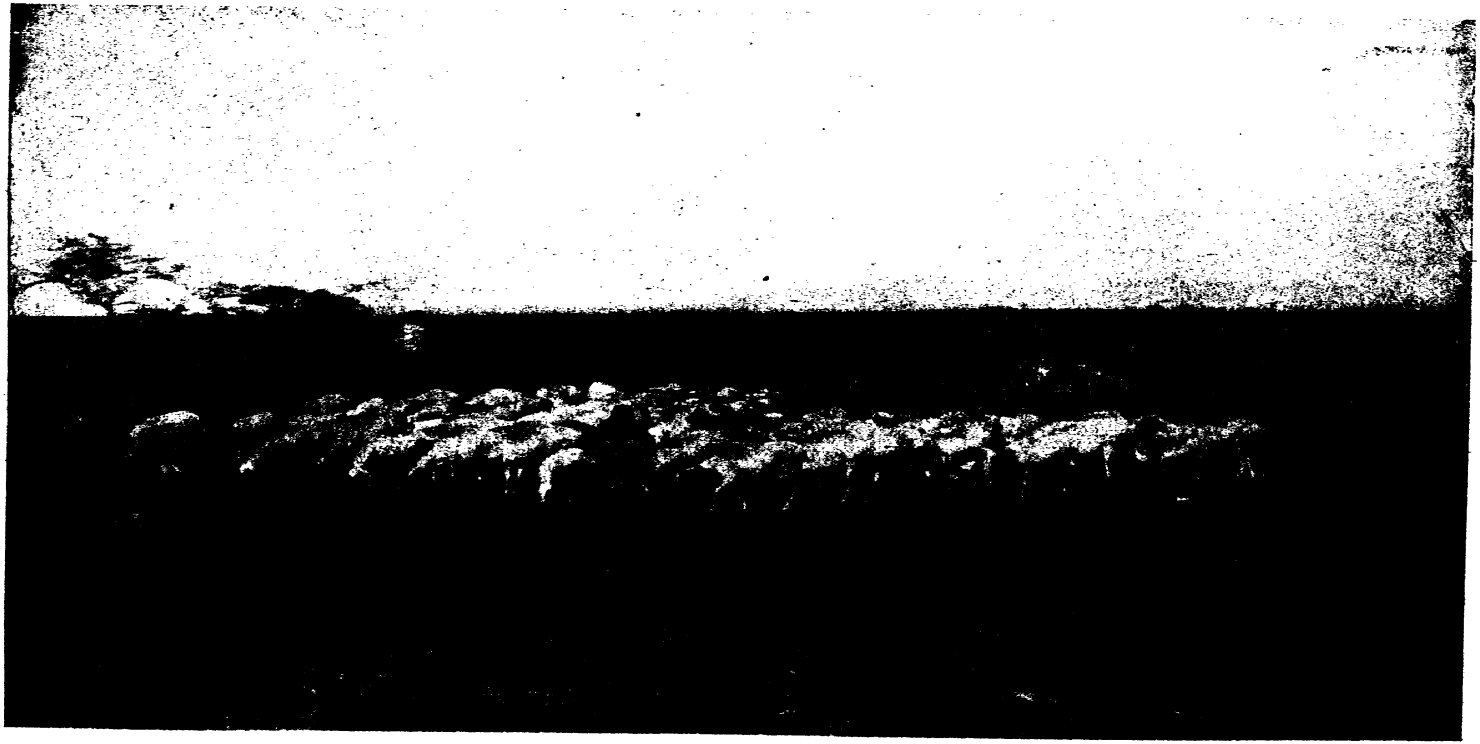
slightly north-east of the Shangani Siding to Inpateni and the junction of the Insiza and M'zingwani Rivers.

Taken as a whole, the district is well watered, particularly the granite veld, which over large areas remains moist throughout the whole year. The watershed extends along the left of the formation already described from Insiza station to Filabusi. Those streams rising on the western slopes flow into the Insiza, those on the east into the Ingezi, M'chingue and Nuanetsu, all eventually passing into the Crocodile River. A peculiarity in this watershed is that the streams flowing into the Insiza are only active during summer, while those flowing to the east are perennial. The granite flats extending for many miles to the west of the Insiza River and to the east of the belt of formation are splendidly watered with perennial streams. This applies also southward to Filabusi, at which point the whole nature of the granite changes, and water is very scarce in many places during the dry months.

Unfortunately, many of the streams flowing to the west are all but dry during the winter months, or at best, consist of a series of pools fed by weak springs. Old residents comment on the decrease in the annual rainfall, and as a result smaller areas of land which can now be irrigated. Throughout the district, however, excellent sites can be found for irrigation schemes on a moderately large scale, but most of these would entail considerable capital outlay, and their time is not yet. The present extent of irrigated land is about seventy acres, while the potentialities of the granite vleis are only now being realised and made use of in a modest degree.

The district is probably one of the healthiest in Southern Rhodesia both for man and beast. In many parts fever is almost unknown, while liver sickness in calves on the formation, but not on the granite, appears to be the most serious stock disease.

Passing through this peaceful and apparently prosperous district to-day one can hardly realise that only fourteen years ago it was one of the main centres from which the rebellion spread, and was the scene of some of the first fighting to take place, and of the tragic murder of the Cunningham family, on the farm Kildare, now occupied by Mr. Stoddart.



Sheep on Somabula Flats.

Fortunately, in a district so far removed in parts from the railway, the mining industry is well represented, and the following mines afford local farmers a market for maize and meat, butter and beans, eggs, milk, onions, potatoes, etc., the Nellie, Peggy, Clairmont, and only 25 miles away the Bush Tick. The prospects of these mines are justifying the expenditure of large sums in development work, and the Insiza Farmers have been wise in their generation, and have made friends with the mammon of the mining industry to the mutual benefit of both. There is every reason to believe that the district can produce locally the bulk of the food supplies necessary for the maintenance of the mining community; the latter have but to definitely make known their requirements, and supplies will be forthcoming.

Insiza farmers have until recently devoted their main attention to cattle raising, and as fine herds can probably be seen here as anywhere in Southern Rhodesia. Among the largest cattle owners are Mr. T. Meikle, Mr. Bawden, Mr. White, De Beers Co., and Mr. Gooch, while in statistics recently collected by the writer when visiting the district, the total number of cattle is given as just over 5,000, of which 3,200 are breeding stock. It is interesting to note that in 1904 the estimated total number of cattle in the district was put at 3,700. Several of these breeders own considerable areas of land, over which the cattle are run, and the proximity of the granite veld largely obviates the necessity of growing winter fodder, since by a judicious change of grazing from formation veld to granite native and cross-bred stock can be kept in fairly good condition all the year through. This does not apply, however, to those who are practising dairying, and as the finer blood of shorthorn and other imported breeds makes itself felt, the need of providing for winter feeding becomes apparent; since without it, practice has shown that to rear healthy calves, and at the same time to milk the dams, is neither profitable or feasible. Residents of Salisbury are probably not aware that a considerable proportion of the butter they consume comes from the Insiza district, yet this is nevertheless a fact, and breeders such as Messrs. Whyte, Bland, Gooch, and Browning look to Salisbury as a market for their surplus supplies.

Dairying in one or other of its forms is well recognised in the district, and while some farmers, such as Mr. Stoddart

and Mr. Ashburton, supply butter or milk to the mines, others like Mr. Jones, of Innesfallen, send their consignments of cream to the Bulawayo creamery. The district is undoubtedly an excellent one for all horned stock, and with its many natural advantages, the future is likely to see the dairying industry with pig raising as a subsidiary coming more and more to the front.

Sheep have not yet become general on the farms of the district, and the veld is not at present suitable for woolled breeds, but there are several flocks of good quality Persians and cross-breds, those of Mr. Bawden being a particular useful lot. Many of the new settlers on the Somabula Flats have also brought up sheep, and these at present promise exceedingly well—those of Mr. Battis, shown on Plate I., are outstandingly good. The total number of sheep in the district is about 2,250, and of goats 300. Owing to the healthiness of the district, horses and mules are more commonly met with on the farms than in other parts of Rhodesia, the numbers given are as follows:—Horses 22, mules 42, donkeys 107.

Pigs are not receiving as much attention as one might expect, in view of the demand for pork which there should be on the mines. Mr. Bawden and Mr. Rixon are among the largest owners of pigs, but the total number for the district is only given as 115. Poultry in fair numbers are to be found on almost every farm, and there are upwars of 1,200 head in the district.

As has already been hinted, the best arable land is found on the farms of the formation, and many of the pockets contain alluvial deposits of soil of great fertility. The contour of the country is much broken; the homesteads are usually situated on the slope of the hills, while the lands lie below in narrow valleys among the koppies. As is invariably the case in country of this nature, the extent of good arable land on each farm is rather small, varying from one to three hundred acres, but at present only the best of the land is being worked, and as the need arises, a large area, though possibly of inferior fertility, will be brought under the plough. The lands themselves are usually comparatively small, and this naturally adds considerably to the cost of working. The main crops of the district at the present time are maize, potatoes, onions, beans—in other words, produce

which, though not exceedingly bulky to transport, yet meets with a demand on the local mines. Statistics indicate that last season upwards of 3,230 acres were planted to maize, 77 acres to potatoes, 23 acres to beans, and 14 acres to onions. The latter crop has been grown with considerable success, and yields of 100 bags per acre have been obtained. Onion thrip is, however, an ever present danger, and the crop is therefore somewhat risky. Such irrigated land as is available is usually devoted to onions, potatoes, green barley, and vegetables, with the result that the amount of oat forage or wheat grown in the district is negligible—estimated at ten acres in all.

The class of maize most in favour is hickory king, and boone county has one or two supporters. Yellow maize is not in favour. On the best land crops of 8 to 10 bags per acre are not uncommon, while potatoes give from 60 to 100 bags, and beans from 3 to 4 bags an acre.

Owing to the scarcity of arable land Boer manna and other summer forage crops are not grown to any extent, and tobacco also has been rather neglected up to the present (three acres planted last season), though at the point of contact of the granite and the formation, there appears to be soil well suited to produce a good bright leaf. Mr. Carlssen has been successful in growing a leaf of good average quality, while Mr. Harris on Infiningwe had a promising crop this season on granite soil. Subsidiary crops which are grown are turnips, 6 acres; mangels, 7 acres, Boer manna, 17 acres; pumkins, 7 acres, lucerne, 1 acre; linseed, 2 acres, and ground nuts, half an acre. Mr. Rixon makes a practice of growing an acre or two of mangels, which are started with the rains in January or February, and finished off with a couple of irrigations. On the same farm lucerne is now doing well, though much troubled by weeds, until sown in drills—the previous sowings having been made broad cast.

Continual summer cropping year after year is beginning to show its evil effects, and on several of the older established farms manuring and rotation of crops is becoming necessary. The lighter soils of the district appear well suited to ground nuts, and the future is likely to see an extended use of these as a rotation crop, the nuts being used either for pig food or for sale to the mines when prices are sufficiently good.

Citrus fruits do well on the formation, but owing to the distance from the railway, no great amount of attention has yet been paid to citrus planting. Amongst the largest growers are Mr. Rixon, Mr. Bland, Mr. Bawden, Mr. Whyte, and Mr. Stoddart. Many of the trees planted some years ago have proved anything but satisfactory, but this is probably largely due to wrong stocks being used in the first instance. Deciduous and stone fruits are not yet grown to any great extent, largely on account of the usual difficulties which are met with elsewhere in Rhodesia. About 1,600 seems to be the total number of mixed fruit trees in the district.

Several of the farms in the formation have considerable areas of vlei land, which remain moist throughout the whole year, thereby affording possibilities for growing winter cereal crops without irrigation. Instances of these are Thornville and Eagle Farm, but this state of affairs is even more in evidence on the Sombula Flats, which in appearance is totally unlike the rest of the district. The flats extend, as has already been said, from just north of the headwaters of the Shangani River to the north-eastern boundary of the district, and from the headwaters of the Ingesi River. The country, down-like and continuously undulating, is interspersed at very short intervals by streams of running water the land on each bank of these streams being as a rule extremely swampy, and retaining it moisture winter and summer. During the present season many of the maize lands situated even on the bults suffered from excess of moisture, due to insufficient drainage. Unfortunately, the soil is poor, being for the most part composed of granite sand, though in the vleis, owing to the presence of decaying organic matter, it is somewhat richer. The flats have recently been settled by the Lands Department, and the newcomers are well pleased with their farms.

Cattle and Sheep are so far thriving well, and though we may fear that most of the land may prove too wet for summer crops, yet, with the addition of manure, the possibilities of growing all classes of winter crops and winter grasses without irrigation appears to be immense. These farmers are tackling what is a somewhat new proposition, namely, the granite veld for mixed farming—cattle, sheep, crops, etc. It is not so long ago that the Gwibi Flats, near Salisbury, was



Kraal made of Hay Bales, Insiza District.

looked upon as worthless for farming purposes, yet to-day it comprises some very excellent farms; may the future hold the same fortune for the Somabula Flats. The Somabula farmers have shewn their enterprise by forming themselves into a local Farmers' Association—an example which their older established neighbours would do well to follow—while the amouut of land already broken bears testimony that with one or two exceptions they have made good use of their time.

Taking the Insiza District as a whole, the veld is good, but much is what is termed "mixed veld," that is, not composed entirely of sweet grasses, and as a consequence many of the farms will not stand very heavy stocking. The usual sweet grasses common to Rhodesia, namely, sweet grass *(Chloris virgata)*, African red top *(Tricholoena rosea)*, and quick or fine couch grass *(Cynodon incompletus)*, are met with on the old lands, while our common enemy the Black Jack *(Bidens pilosa)* is ubiquitous, and on the richer soils bids fair to become a permanency if not resolutely dealt with. The grasses of the unbroken veld vary not a little on the different farms. In some places Rhodes' grass *(Chloris gayana)* is met with fairly frequently, while on the formation and occasionally on the granite *Panicum trichopus* (sometimes mistaken for Paspalum) appears one of the best cattle grasses and remains green late into the winter. Rhodesian Timothy *(Setaria aurea* and *S. nigrisostris)* is common in the valleys and usually indicates good land. The bulk of the veld grasses however are species of Andropogon *(pertusus, serratus, contortus, hirtus,* etc*)*. *Digitaria* and *Aristida*. *Urelytrum* is also found, while on the granite vleis the silvery topped *Imperata sp.* is frequently met with in large patches but affords little nourishment to stock. On the Formation and under the shelter of thorn trees the well-known Buffel grass *(Panicum maximum)* is in evidence.

The cutting and curing of veld grass hay is becoming more and more common, and Plate No. 2 shews two sides of a kraal formed of bales of veld hay on Mr. Bland's farm.

The forest flora of the district presents little of special interest. Several species of Acacia are met with, and around Fort Rixon the wild Wisteria *(Bolusanthus speciosus)* with its beautiful clusters of purple flowers is quite common and

affords a good fence post. M'sasa and M'tondo *(Bracestegia spp.)* appear in places, and the sweet scented *Bauhinia reticulata* and *Pterocarpus sericeus* with its bright yellow flowers and silvery leaves are widely distributed. Owing to the fact that the district is well wooded, exotic trees have not been planted to any great extent. Mr. Campbell, the Native Commissioner at Fort Rixon, has done some experimental planting with gums and pepper trees, but in the majority of cases these have been unsuccessful owing to the attacks of white ants. On account of its reputed resistance of termites and also since it is a fast growing and valuable timber tree, the Indian Cedar *(Cedrela toona)* is worthy of careful trial in the district.

Owing to the presence of mines a good deal of transport is necessary, and the roads throughout the district are for the most part good. For the same reason wood cutting and charcoal burning prove a source of additional income to some of the farmers.

The Insiza District has so many natural advantages, such as salubrious climate, fertility of soil, sufficiency of permanent water on many farms for small irrigation schemes and so forth, that it is to be regretted that there is not more land available for settlement. Of the potentialities of the district there is no question, but it is likely that the future will prove it to be more profitable to consume surplus supplies of grain on the farm rather than to despatch it to other markets in Southern Rhodesia. Given co-operation between the members of the farming community, and a good understanding with the local mines, we predict that the Insiza district will shortly become one of the foremost mixed farming districts of Southern Rhodesia.

The Construction of Dipping Tanks for Cattle.

(From notes kindly supplied by the Public Works Department, Salisbury).

The following particulars may be regarded as furnishing a model estimate of the specifications of work to be done and materials to be used in the construction of a dipping tank on the lines of the accompanying drawings.

Cement.—The cement to be Portland and of the best quality.

Posts.—The posts for race and yards to be Mopani or Mahobohobo, if procurable; to be not less than 5" in diameter at the small end, stripped of bark and well carbolineumed before fixing. The posts must be dressed quite clean to prevent injury to cattle.

Stone.—Stone for concrete to be the best clean granite or quartz, no stone to be larger than will pass through a 2" ring (any way). If quartz rubble is used it must be thoroughly well washed before mixing.

Water.—Water to be clean and free from organic impurities.

Sand.—Sand to be the best clean sharp granite grit; to be free from loam or vegetable matter and if necessary to be thoroughly well washed before using.

Wire. — Wire to be four barb, two ply with barbs 6" apart.

Rails.—Rails to be deal, clean and free from knots and splints. Native timber may be used for rails wherever procurable, but it must be perfectly straight and quite free from knobs or projections that might cause injury to animals.

Excavation.—Excavate for tank to the dimensions shewn on drawings. No more ground must be taken out than is actually necessary. Remove all surplus soils and spread where directed. Before commencing to lay concrete the bottom of all excavations must be well watered and well rammed. Well ram all round the walls of Tank as the work proceeds.

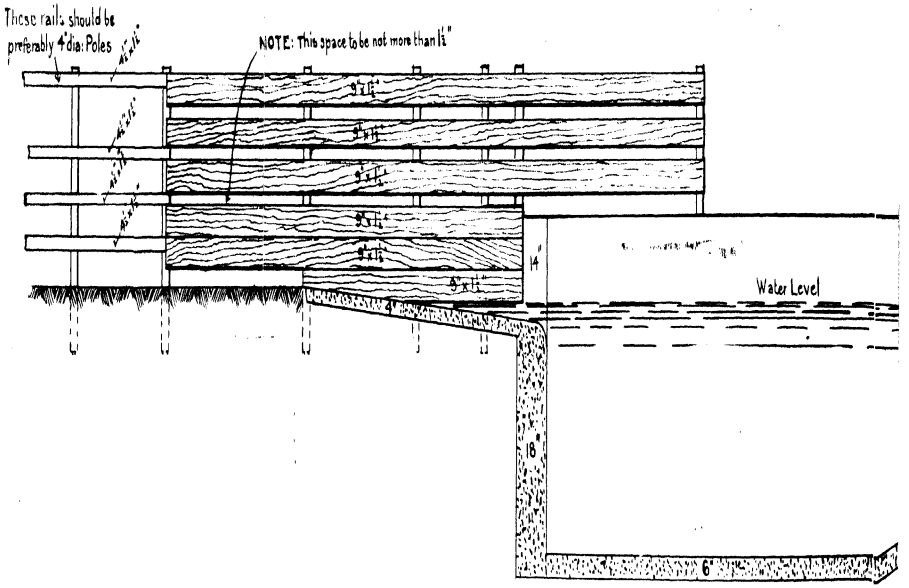
Concrete.—The whole of the materials to be accurately measured in boxes or empty cement casks. The concrete to be composed of five parts broken stone, three parts good sharp sand and one of cement, to be turned over twice in a dry state and twice in a wet state, and when laid in place to be thorougly well rammed. The concrete must be mixed on wooden platform and not on the bare ground. The water must not be thrown on in buckets, but sprinkled on through a fine rose. The two sides and ends of the tank must be completed first, and the floors laid last of all. The concrete must be laid down immediately after mixing. In mixing concrete old material must not be incorporated in the new mixing. All concrete must be laid in boxes made with 1½" boards, and no layer must exceed twelve inches in height. Every old layer must be well wetted before commencing to lay fresh concrete.

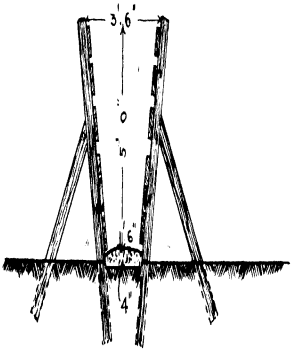
Lay barbed wires in the position shown on section, to run right round the tank, and all to unite; top, bottom, and side wires.

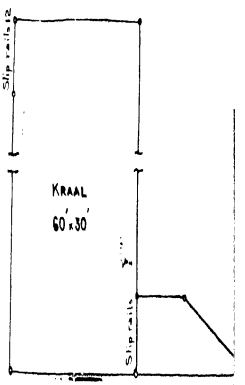
The surface of floor in race, in draining pen, and bottom of tank must be floated up with one of cement to three of sharp sand, to be well trowelled and brought to a smooth fine face. The edge of floor of race, at entrance of tank must be rounded. The surface of slope leading out of tank is to be finished rough, for foothold of cattle, by raking up the surface after ramming. The floor of draining pen must be 4ins. thick at the sides and to slope ½in. towards the centre. Near the entrance to tank leave a hole in the floor of draining pen to be 3in. in diameter fitted with a 2in. outlet pipe. Fit a wooden plug with an iron top and ring. The plug must be left in place when dipping and should be removed during rains to prevent rain water running into the tank. On each side of the race lay a dwarf wall of concrete, to be 4ins. wide to prevent dip washing over the floor of race when cattle enter the tank. The wall will start from ground level and will be 9in. at the end near tank. After completion plaster the whole of the walls of tank inside and out with one of cement and three of sharp sand, steel trowelled, to be not less than ½in. thick, walls well wetted before plastering.

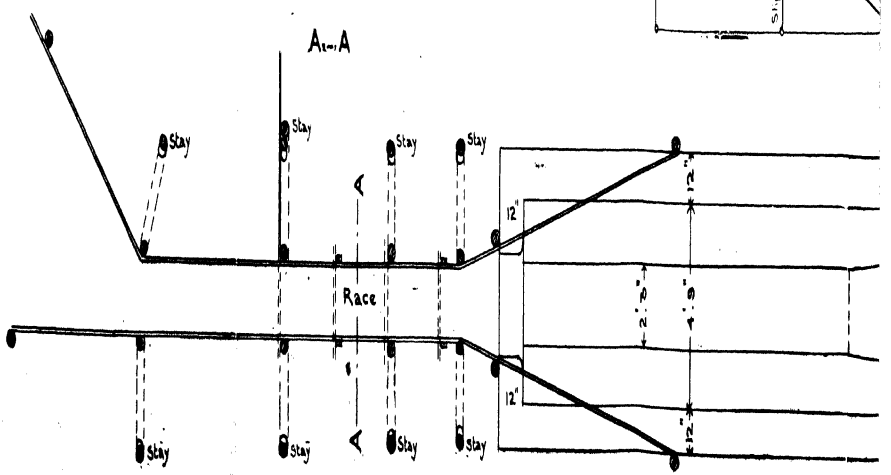
All concrete must be kept well watered as the work proceeds, and all walls to be well wetted for a week after completion. The floors of tank, race and draining pen must be covered with wet sand for 14 days after completion. The



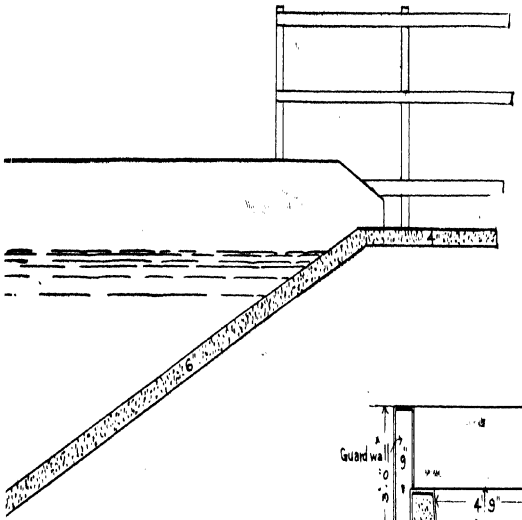

These rails should be preferably 4" dia. Poles
NOTE: This space to be not more than 1½"
3"x1½"
3"x1½"
3"x1½"
3"x1½"
3"x1½"
3"x1½"
14'
Water Level
4'
18'
6'

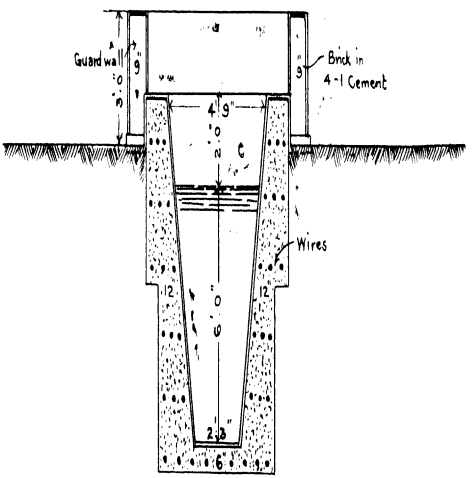

3'6"
10'
6"
4'

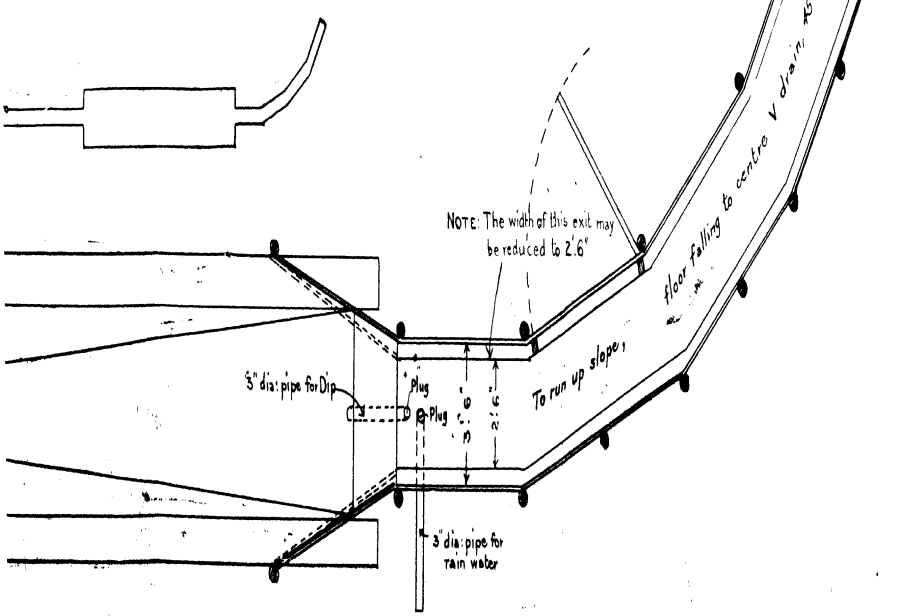

Slip rails 12
KRAAL
60'x30'
Slip rails


A1-A
Stay
Stay
Stay
Stay
Race
12"
12"
Stay
Stay
Stay
Stay

PLAN OF
DIPPING TANK







floors of race and draining pen must be V jointed diagonally from the centre to sides every 18ins., joints ¼in. deep. All concrete must be thoroughly well rammed and kept wet as the work proceeds. The concrete must be laid as quickly as possible and the whole of the materials must be on the ground before commencing to mix concrete. All concrete must be mixed under supervision, and the contractor must give due notice of his intention to lay same before commencing work.

Fencing.—The whole of the posts must be of Mopani or Mohobohobo to be not less than 5ins. diameter at the small end, stripped of bark and well carbolineumed before fixing. The race will be formed of poles or rails as shewn on plan. Posts for yards to be not more than 10ft. from centre to centre, let into ground 18ins. and well rammed. All posts must be 6ft. above the ground and free from knobs or projections. Well spike to posts round the whole of the yards and enclosures, three 3in. x 2¼in. rails, to be the distance apart shewn, all well carbolineumed before fixing.

Fix three 3in, x 3in. slip rails where shewn on plans, to be fixed in strong wire loops well stapled to posts. All posts should be sound and free from hearts shakes. Fix rails diagonally across the ends of tank where shewn on plan to prevent animals jumping on to wall of tank.

Quantities of materials required for a Tank as above described:—

One piece of 2in. pipe 6ft long.
Rails, 6—12 3 x 2¼
„ 12—14 3 x 2¼
„ 48—20 3 x 3¼
Slip Rails, 6—10, 3 x 3
„ 3—15, 3 x 3
(Native wood may be used in the place of imported timber).
80 posts, 5in. diameter, 7ft. 6in. long
30 posts, 5in. diameter, 8ft. long
1½ coils barbed wire
15 gallons carbolineum
50lbs 5in. spikes
33 casks cement
25 cubic yards broken stone
18 cubic yards sand.

Notes from the Agricultural Laboratories.

BOTANICAL.—MAIZE SMUT (Ustilago maydis).

[Compiled.]

Maize Smut at the present time is fortunately not a very serious menace to our staple crop, but nevertheless it is a disease which, if neglected, may in future become a source of no little trouble and loss to the Rhodesian farmers, more particularly on those farms where the restricted area of arable land often preludes rotation of crop or summer fallows on any extensive scale. In most large fields of maize a few smutted ears are to be met with and some knowledge of its appearance and habits will be of interest and value to all those who wish to keep their crops free from this disease.

Plate I shows the male inflorescence or *tassel* of the maize plant infected with smut, while plate 2 shows the same thing on the female inflorescence or embryo ear. The general appearance of the disease is well brought out in these illustrations, and those who are not already acquainted with it should have no difficulty in recognising it when it appears.

The smut fungus may be termed a microscopic parasite plant, living within the tissue of the maize plant, and drawing its nourishment therefrom. This powder, or as we commonly term it, smut, consists of vast numbers of reproductive bodies, technically known as spores. By means of these the fungus reproduces itself during favourable conditions of temperature, giving rise to secondary bodies, which are carried about by the wind, or may fall to the ground, and there remain dormant until the following spring.

It has previously been inferred that the maize smut of Southern Rhodesia, and of South Africa generally, was the common American corn smut (Ustilago maydis D.C.), but in the May, 1910, issue of the Agricultural Journal of Victoria

(Australia), McAlpine, vegetabte pathologist, draws attention to the fact that the maize smut of that State is dissimilar to American corn smut and he identifies the former as Head smut of maize (Sorosporium reilianum (Kuehn: McAlp).

The writer has on several occasions commented on the fact that in South Africa maize smut seldom if ever makes its appearance on parts of the plant other than the male or female inflorescence, whereas the American corn smut is reported to attack any young and tender parts, setting up a local infection, which takes the form of smut boils—though it is admittedly the cob which is most frequently attacked. Microscopic examination of the smutted heads depicted in the illustration showed that in this instance the fungus resembled Sorosporium sp., as described by McAlpine, and not that of Ustilago sp.

Whether or no both head smut and American corn smut are present in Southern Rhodesia can only be ascertained by extended investigation, but I am of the opinion that the Sporosporium sp. is the form more commonly met with, and a brief summary of McAlpine's findings will be helpful to Rhodesian farmers.

The American corn smut makes its appearance on any portion of the plant above ground, and occasionally even on the roots, and gives rise to smut boils, which may, in the case of the cob, attain the size of a man's head. The infection of the young and tender tissues, whether of the seedling, or the leaves and stem, or of the male or female inflorescence, may take place at any time during the growing season, through the agency of wind-carried reproductive spores, and cannot, therefore, be well controlled. The Head smut, on the contrary, attacks the embryo cobs and tassels, and is usually confined to them, though occasionally a few patches appear on the leaves or on the enveloping bracts (husks). The Head smut is said to be found also on Sorghum, and McAlpine suggests this as accounting for its appearance in America, where it is occasionally met with. This explanation will also account for its presence in South Africa, since the disease may be introduced to our maize crops from the Kafir corn (Sorghum vulgare) crops of the indigenous natives. McAlpine states that Head smut

first appears encased in a pinkish or white skin, which soon ruptures to allow the escape of the spores. Fully developed smut heads are very conspicuous, but even before these are exposed the disease may be detected while infected plants remain green longer in the field. Experiments were conducted to ascertain the usual manner of infection, and up to the present evidence goes to show that, as is the case with smut in wheat and barley, the disease is disseminated by infected seed, and that by "pickling" the seed is a 2 per cent. solution of blue stone, or 1 lb. of sulphate of copper to five gallons of water, the danger may be greatly lessened. It is further stated that when formalin was used instead of blue stone, the results were not satisfactory. In the case of American corn smut treatment of the seed is ineffective.

TREATMENT.—Where a crop is found to be infested with smut, whether American smut or Head smut, and as soon as the disease makes its appearance, the land should be carefully gone over, and all smutted ears should be cut off and placed in a sack. Care should be taken to avoid scattering the black dust over the surrounding ground and plants, and both the sack and its contents should be entirely destroyed by fire. Smutted plants should not be fed to stock, as in so doing there is a danger of infecting the manure with germinating spores. Owing to the fact that Head smut spores may adhere to the seed, and so infect the following crop, it is advisable to discard for seed purposes any part of a crop known to have been infested. In exceptionally bad cases clean seed, new land, and a change of crop for two or more seasons on the infected land is recommended. Where, however, there are good reasons for not discarding seed from a crop showing signs of infection by Head smut, the smutted plants having been destroyed as above indicated, in addition, the grain reserved for seed should be treated with blue stone.

The writer will be glad to receive specimens of infected plants, and to advise as to treatment, but in the meantime, where the disease is in evidence, either of these smuts can be largely kept in check by collecting and burning all infested plants and ears.

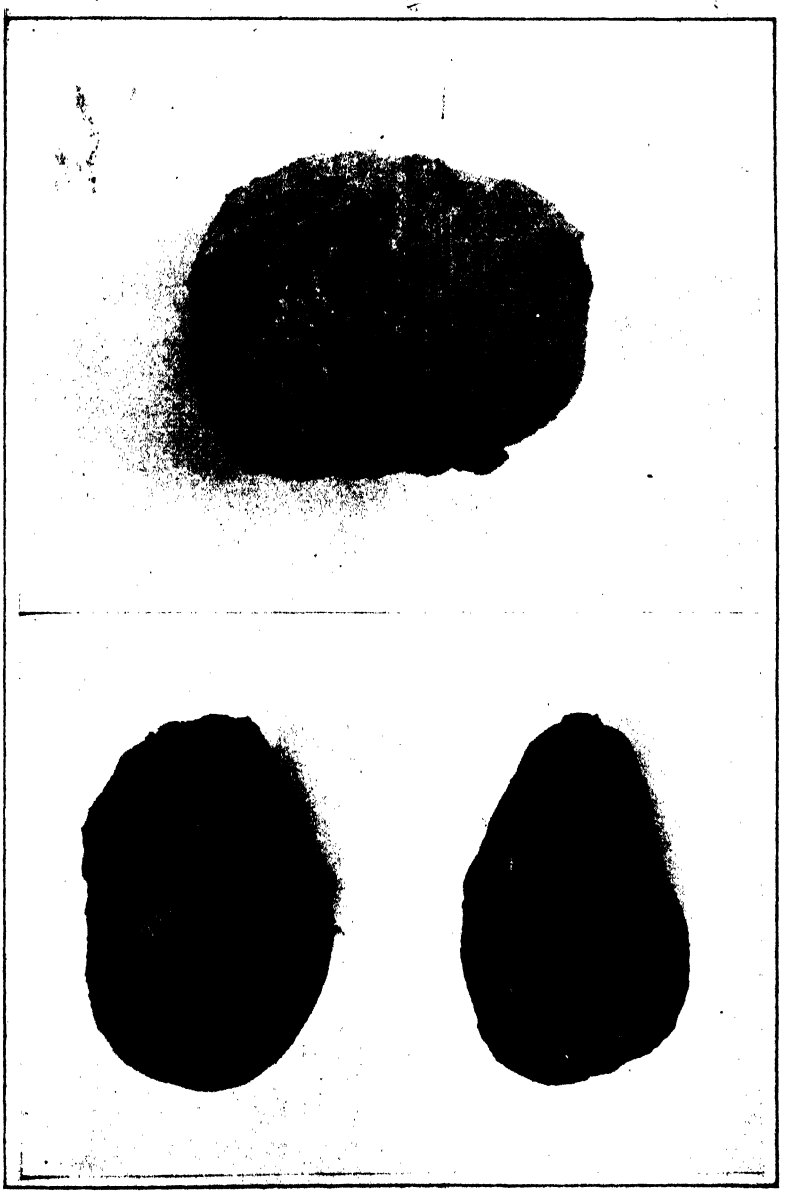
H. G. M.



Maize Smut—Plate I.



Plate II.



1. *Tuber infested with Root Gall Worm showing characteristic Galls.*
2. *Tubers infested as above, shewing distinction by Dry Rot (Fusarium solani).*

ENTOMOLOGICAL.

ROOT GALL WORM IN POTATOES.—Specimens of tubers showing swellings on their surfaces, in some cases accompanied by marked decay, have been received from various parts of both Mashonaland and Matabeleland during the past month (see accompanying plate, fig. 1). These tubers proved to be infested with the pest known as Root Gall Worm (Hederodera radicocola). The root gall worm is not an insect, but belongs to the order of *Nemaïoda* or "Thread Worms," and the family *Anguillulidae* which includes the "Eelworms." The pest is microscopic in size. The young stages and the adult males are, in the environment of the tuber, invisible to the unaided eye, but the swollen female may be distinguished on the cut surface as a minute whitish speck. The newly hatched young are termed *larvae*. They are slender and active, making their way through the tissue of the host plant. They moult and become male and female. The females come to rest in the tissues and begin to swell. The males remain very slender. A fertilised female swells up until she is almost globular, or rather flask-shaped, and produces a large number of eggs, which hatch within her body. She gives up her life in this process. The pest is spread by the decay and breaking away of the infested tissues, a large number of active larvae being in this way released into the soil, where they speedily set about seeking a new host. The larvae may also voluntarily work their way out into the soil and seek a new host.

This pest attacks a very wide range of plants, including many trees, cabbages, carrots, parsnips, melons, cucumbers, grape vines, tobacco, peas, etc., in addition to a number of wild species. In the plants attacked they cause very pronounced knobby swellings on the roots, hence the name root gall worm. Their presence in numbers is followed by decay in the tissues and frequently by the wilting of the infested plants. In the case of potatoes the infested tubers yield very readily to the attack of the common Dry Rot (Fusarium solani), and some of the specimens submitted to the writer were much decayed owing to the work of this fungus (see accompanying illustration fig. 2).

Once a piece of land has become thoroughly infested by the Root Gall Worm, the successful raising of any of its favourite host plants becomes practically impossible. In some parts of the world the pest is described as killing off nursery stock, and sometimes even large trees. Under any circumstances if the pest is plentiful the proper development of the tree is interfered with and its growth stunted. It is distinctly unprofitable to plant potatoes on infested land, as the tubers themselves are rendered unsightly and their market value greatly reduced. In addition, their keeping properties are greatly impaired. There are two conditions which favour the increase of the pest; the first is the presence of abundant moisture, hence the prevalence of the pest on irrigated land. The second is a light sandy and easily penetrable soil.

In Europe and countries where land is valuable and where it is often necessary to use the same plot for one crop year after year, a certain amount of success has been obtained from cleansing the land by what is known as a trap-crop. The land is sown with some plant of which the pest is very fond. Carrots have been used for this purpose. The roots of this plant are kept under careful observation, and when the "galls" have become well developed, but before any decay sets in, the whole crop is dug up and burnt. It is necessary to *dig* up the plants. If they are pulled many of the "galls" will be detached, and consequently many worms left in the soil. By this means it has been found possible to clean the land, so that the profitable crops can be grown for two or three years without serious damage.

Under Rhodesian conditions, however, where land is plentiful, such methods are hardly economical. The best method is to plant the infested land with mealies or cereals, or some crop not affected by the pest, and to use other land for potatoes.

BLACK ORANGE APHIS.—This is a pest of citrus trees which seems to attract more attention than any other in this country. It is, however, really of minor importance compared with the less conspicuous scale insects that infest the same trees. The young shoots are the portions attacked, the insects clustering thickly towards the terminals, in a similar

manner to their near relations the "green fly" of rose bushes, with which everyone is familiar. Like certain scale insects, black aphis secretes a sweet substance, known as "honey-dew." This drops on to the leaves beneath, and is commonly accompanied by a growth of the sooty fungus (Fumago sp.), which covers the leaves like soot and renders the presence of the aphis very conspicuous. Although not usually a serious pest, the presence of the aphis, which sucks the juices of the shoots and of the accompanying fungus, which interferes with the respiration of the leaves, is deleterius to the health of the trees.

They can be easily destroyed by various washes. In the case of a few trees, spraying with a solution of soap (preferably soft) in water, at the rate of 1 lb. to 3 gallons will kill the pest. When applied to a large number of trees this is rather expensive. A reputable brand of tobacco extract, such as used for making sheep dip, may be diluted at the rate of 1 part to 100 parts water, and is very effective. A weak solution of paraffin emulsion may also be used. This wash is prepared as follows:—Take 1 lb. of soap, cut into thin slices and boil until dissolved in 2 gallons of water; then pour the liquid at once into a vessel containing 4 gallons of paraffin oil; place a bucket pump in the mixture and churn thoroughly, by pumping and pointing nozzle back into the liquid; this should be continued for five minutes. The emulsion will become almost immediately pure white, and will foam up to some extent. If the mixture is churned up with a stick or similar instrument, the motion should be continued for 10 to 15 minutes. Dilute this concentrated emulsion with 15 gallons of water, and it is ready for use.

CITRUS PSYLLA. — Another citrus pest of a not very serious nature has on several occasions lately been brought to the notice of this office. The young leaves of citrus trees have been observed to be distorted in the form of pockets, opening on the under surface, and the whole shoot to have a crinkled and blighted appearance. The cause of this is an insect known as the Citrus Psylla (Trioza sp.) The family to which this insect belongs, the *Psyllidae*, contains a number of insects which are termed "Jumping Plant Lice." This name refers to the habits of the adults, which are winged, and can fly or jump with equal ease. It is to the young forms that the pockets in the leaves are due, for though

they are capable of crawling, they seem to prefer to rest in one spot on the underside of the leaf, and at this spot the gall or pocket is formed, the insect fitting neatly into the cavity beneath. The insect is supposed to be a native of South Africa, and rarely does much damage, except to young trees. For its destruction the use of paraffin emulsion, when the young leaves are expanding, is recommended, and this will be the most convenient wash to use. Resin wash is also effective, but more troublesome to prepare. The method of preparing this wash is described under "Notes from the Agricultural Laboratories," in the "Agricultural Journal" for April, 1910.

MAIZE STALK BORER, OR "MEALIE GRUB."—This well-known insect is only mentioned here to give a piece of timely advice to those who may not be acquainted with the effective method of preventing it from becoming a very serious menace to their maize crop. The "Stalk Borer" passes the winter as a larva, or "grub," inside the stalks of the plants infested. It turns into a pupa, or chrysalis, late in the winter, and emerges as a moth in the spring. In order to prevent the appearance of a large number of moths to lay eggs on, and to infest the young maize plants, there is one obvious policy to pursue. *The maize stumps must be grubbed up and burnt before the moths appear.* When this number of the Journal appears it will be good time to set about carrying out this measure. Mr. C. W. Mally, the Entomologist of the Eastern Province of the Cape Colony, carried out extensive experiments with this method of prevention with most excellent results. The conversion of the green maize plants into ensilage achieves the same object. It cannot be too strongly urged upon the farmer, new to this country, that the Maize Stalk Borer is capable of inflicting serious financial loss, and that the adoption of preventative measures, as here suggested, is most earnestly to be recommended. The farmer who shirks the trouble and expense of destroying the mealie stumps, contenting himself with ploughing them into the ground, is liable to pay for false economy by the loss of a large portion of his crop later on.

R. W. J.

CHEMICAL.

BATS' GUANO.—This material, small deposits of which occur in caves in many parts of Rhodesia, consists chiefly of the excrement and remains of bats, and to a less extent of other cave dwelling animals. The valuable manurial constituents usually present a fair quantity in bats' guano are nitrogen and phosphoric oxide; a third, namely, potash, being found in small amount. Part of the phosphoric oxide is in a form soluble in water, and can therefore be utilized by plants almost at once. The nitrogen of the guano, if present in quantity, generally exists in three forms:—(a) as nitric nitrogen; (b) as ammoniacal nitrogen; (c) as organic nitrogen. These three forms represent three states or gradations of availability; growing plants can make immediate use of form (a), whereas forms (b) and (c) undergo changes in the soil before the plant assimulates them. As the (b) form becomes available more quickly than the (c), an application of guano to the soil furnishes a gradual supply of available nitrogenous plant food.

Two samples of bats' guano recently examined at the Agricultural Laboratory gave the following results:—

A.—from Figtree

	%
Loss on ignition of dry material (organic matter and combined water)	54.06
Nitrogen	8.08
Phosphoric Oxide	4.10
Potash	1.94

B.—from Sinoia, Lomagundi

	%
Loss on ignition of dry material (organic matter and combined water)	75.81
Nitrogen	9.94
Phosphoric Oxide	4.82
Potash	1.75

These analyses, which give the percentage amounts of the valuable fertilizing ingredients present, show that both have high manurial values.

Cape Government guano—obtained from the islands off the West Coast of Africa—costs about £13 per ton delivered in Salisbury. Taking this as a basis of comparison, the deposit from which sample A. was drawn is worth about £8 per ton, and that from which sample B. was obtained about £10 per ton. Since bats' guano is very variable in composition, these values do not apply to all deposits of this nature, and I must point out that the prices quoted are only *comparative* and do not necessarily represent their *real* values. At present we have no definite data to shew that the use of Cape guano at £13 per ton or the above-mentioned deposits at £8 and £10 per ton respectively would be a profitable investment for the Rhodesian farmer except perhaps for special purposes; very little has so far been used in the country.

The amount of bats' guano to apply to the soil depends on the proportion of fertilising ingredients present; deposits having the above composition applied at the rate of 100 to 150 lbs. per acre should produce a marked improvement. Whilst both deposits contain the three manurial ingredients, nitrogen, phosphoric oxide and potash, neither is well balanced in respect to the proportionate quantities of these constituents present; the phosphoric oxide and potash are low compared to the amount of nitrogen, thus a manurial dressing such as the following, in which the guano is supplemented with phosphates and potash is to be preferred.

100 lbs. bat guano
50 lbs. double superphosphate (90% soluble phosphate)
30 lbs. sulphate of potash (50% potash).

The three fertilisers could be mixed and applied together just before planting, and the cost of the above quantities of superphosphate and sulphate of potash landed in Salisbury would be about 15s. per acre in addition to the cost of the guano. Owing to the expense involved, the supplementary dressing suggested should not be used over a wide area until it is ascertained that the increased yield covers the cost of the manure.

It is of interest to note that in some parts natives are chary of giving information of the existence of such supplies, as they are valued by witch doctors as a source of a potent "mouti."

G.N.B.

How to make use of the Fencing Ordinance---1904.

By N. H. CHATAWAY.

The procedure necessary to obtain the enactment of the Fencing Ordinance of 1904 briefly sfated is as follows. The owners of landed property in any district desirous of having the ordinance brought into operation should first frame a petition in the form set forth below.

PETITION IN TERMS OF SECTION 4 OF THE FENCING ORDINANCE, 1904.

District.....

Date.....

To the Director of Agriculture, Salisbury.

Sir,--We, the undersigned being residents of Southern Rhodesia and the owners of the landed property situated in the District of..... as described below, do hereby request that His Honour the Administrator may be pleased, in terms of Section 4 of the Fencing Ordihance of 1904, to put into force and apply the provisions of Part I of the said Ordinance to the undermentioned area.

Description of area:—

That District, or that portion of the District of (as the case may be)..... within the following boundaries. From the.....beacon of farm along the..... and.....boundaries of this farm, thence along the.....boundaries of.....farms, etc., etc., etc.

Signature	Residence	Name or Description of Landed Property owned.

This petition must be signed by at least two-thirds of the owners of land within the area resident in Southern Rhodesia (not necessarily resident on the land they own).

It should be noted that each owner has only one vote irrespective of the number or size of properties within the area that he owns.

An "owner" is described in the Ordinance as—

(a) Any person, company, co-partnership, or public body in actual occupation of or entitled as owner to occupy any land alienated from the British South Africa Company, or entitled by virtue of any certificate or document conferring a right to claim any land from the British South Africa Company.

(b) The Council, or other governing body of any Municipality or Corporate Town, in respect of all lands to which or to the use of which the inhabitants of such Municipality or Corporate Town have acquired or may hereafter acquire a common right.

It follows from this that lessees of farms, in which must be included holders of land under "permit of occupation" have no vote.

A notification is to be issued in the *Government Gazette*, and one or more newspapers (if any) published and circularising within the District at least once a week for three consecutive weeks. If there is no newspaper published in the District the Notice should also appear in the paper published in the nearest District.

The following is a suitable form:—

NOTICE.

FENCING ORDINANCE, 1904.

Notice is hereby given that it is the intention of owners of landed property situated in the District of..... as described below, to petition His Honour the Administrator to bring into force and apply the provisions of Part I of the Fencing Ordinance of 1904, to the undermentioned area:—

Description of Area :—

That District, or that portion of the District of (as the case may be.....within the following boundaries : From the.....beacon of the farm..... along the.....boundaries of this farm, thence along the boundaries of the farms..... etc., etc., etc.

Dated at....., Signed..... this.....day of.....191 , for self and Co-petitioners.

As soon as these formalities have been complied with, the petition, accompanied by a copy of the notice and a sketch map of the district or area referred to, should be forwarded under a covering letter to the Director of Agriculture, Salisbury, requesting him to submit to and recommend the same for the consideration of His Honour the Administrator.

The covering letter should state the dates of *Gazette* and newspapers in which the notice appeared, and it should be signed by an owner or agent representing the petitioners to whom all subsequent correspondence on the subject will be addressed by the Director of Agriculture.

When the proposal has received the sanction of His Honour the Administrator, it then becomes competent for any landowner within the area to require his neighbours to join in or contribute to the construction of fences on mutual boundaries, in such proportion as may be agreed upon between them. To this end he should serve a notice in writing on the person he desires to contribute, specifying the boundary to be fenced, the kind of fences and mode of erection proposed. *(See specimen letter A.)*

If within three months no agreement is arrived at in respect of any of the above points the matter is to be settled by arbitration. *(See specimen letter B.)*

If either of the parties fails to carry out any of the work of construction that he has agreed to do, or has been allotted by an Arbitrator, the other party may carry it out and recover the share of the cost that the first party should have contributed, in any Court of competent jurisdiction.

The person called upon to contribute to the construction of a dividing fence may, by giving notice within one month of the amount being fixed for which he is liable, pay such amount by equal annual instalments with interest at 6% per annum added. *(See specimen letter C2.)* If the capital amount does not exceed £100 the payments may be extended over five years, and if the amount exceeds £100 the payment may be extended over ten years. In a schedule to the Ordinance there is given a table for calculating the amounts payable every year for five or ten year periods.

Owners of land adjoining an area on which the Fencing Ordinance is duly proclaimed, must contribute towards the cost of fences on that boundary.

When an owner is absent, or cannot be found, or any land is unoccupied, the owner of any adjoining land who wishes him to contribute to the cost of a fence must advertise at least once a month for three months in the *Gazette* and a paper circulating in the district, requiring him to contribute. *(See specimen notice D.)* He may then obtain an order from the Magistrate authorising him to proceed with the construction. If thereafter any person goes into occupation of the adjoining land he may serve him with a notice within one month, (*see specimen letter E.*), and recover half the then value of such fence.

Tenants, excepting those whose unexpired term of lease does not exceed one year, are liable to pay interest at the the rate of 6% per annum on half the cost of construction; and tenants who have the right of purchase are liable to have any sum paid by the owner for construction of fence added to the purchase price.

Owners of land on either side of dividing fences are liable for the cost of repairs in equal proportion. An owner can serve on his neighbour a notice requiring him to assist in repairing such fence, (*see specimen letter F.*), and if the second owner refuses or neglects to do so, after one week the first owner can make the repairs and recover his share from the second. Fences destroyed by accident may be repaired without notice. If the fence is damaged through the neglect of either of the parties he only is liable for the whole cost of repairs.

The Ordinance does not affect any substantial fence already erected at the time of the coming into operation of the Ordinance.

Part II. of the Fencing Ordinance applies to the whole of Southern Rhodesia, whether Part I. is in force or not and contains the following provisions:—

If the owner of any land erects a fence on the boundary of his land, and any other person shall adopt any means by which such fence shall be rendered of benificial use to himself, he shall be liable to pay the owner of the fence interest at 6% per annum on half the then value of so much of the fence as he makes use of, and shall also be liable for half the cost of repairs.

Any person erecting a fence on land covered with bush is entitled to clear the bush for a width not exceeding six feet on either side of such fence and to remove any tree standing in the direct line of such fence. The cost of clearing may be adeed to the cost of the fence in cases where any part of the cost of the fence is to be recovered from another party.

Where a river forms the boundary of contiguous lands but is not capable of resisting the trespass of animals liable to be impounded, it shall be competent for the owners to agree upon such a line of fence on either side of the river as shall secure such fence from the action of floods; and in the event of their not agreeing upon such a line of fence, and whether any or what compensation in the shape of an annual payment shall be paid to either party for loss of occupation of land the question shall be settled by arbitration.

If the owner of any land shall clear the same of inflammable materials for the space of fifteen feet from any boundary fence and the owner of the contiguous land shall neglect so to clear his land, such owner shall be liable for any damage done to the fence by fire due to such neglect and is required to make good the damage within one month failing which the neighbouring owner may make good the damage at the expense of the owner in default.

Every person engaged in constructing or repairing a fence under this Ordinance may enter upon the contiguous lands, if necessary, at any reasonable times and do any reasonable acts thereupon that may be required for the construction or repair of the fence, but he may not enter

upon any cultivated ground, garden, plantation, or pleasure ground or cut down or lop any fruit or ornamental trees or shrub without the consent of the owner.

Any owner to whom any amount may be due by any person by way of contribution towards the construction of a dividing fence, may call upon such person to pass a mortgage bond upon his land. (*See specimen letter G.*) If the said person shall refuse or fail to pass such mortgage bond the owner may notify to the Registrar of Deeds the fact that the amount is owing and no mortgage has been passed. (*See Specimen letter H.*) The Registrar of Deeds shall then notify the person named, the fact and particulars of the notification received from the first party, and if no objection is lodged within three weeks the amount of the debt is registered in the Deeds Office and no transfer or mortgage on the property can be passed until the bond above referred to has been duly passed. Should any objection be raised no entry shall be made in the Deeds Office registers except with the consent of the said person or upon the order of a competent Court.

Copies of the Fencing Ordinance No. 18 of 1904 may be obtained from the Controller of Printing and Stationery, Salisbury.

Specimen Letters.

A.—Letter calling upon a neighbour to join in the cost of a fence.

Dear Sir,

I beg to inform you that I propose to erect a dividing fence on the border of this farm and that of..... and call upon you in terms of Section 6 of the Fencing Ordinance 1904 to contribute towards the cost thereof. The line concerned runs from.....to

I propose the erection of.....(*here state kind of fence to be erected, material, cost, etc.*) and that.....(*here state proposals for erection, by what means, cost, etc.*)

Yours faithfully,

B.—Letter calling upon a neighbour to go to arbitration.

Dear Sir,

With reference to my letter of..... (see *A*) in view of our failure to arrive at an agreement with regard to(*here state points on which no agreement arrived at*) I now propose that the matter should be settled by arbitration in terms of Clause 7 of the Fencing Ordinance 1904, and have nominated Mr..... to act as arbitrator on my behalf. Will you, please, nominate an arbitrator to act for you.

Yours faithfully,

C1.—Letter acknowledging A. and agreeing to share expenses.

Dear Sir,

I have your letter of..... regarding the erection of a joint fence and in reply beg to state that I am prepared to agree to the terms suggested and to pay half cost of all expenses (*or any other proposals as the case may require*).

Yours faithfully,

C2.—Letter acknowledging A. and requesting to pay by instalments.

Dear Sir,

I have your letter of..... regarding the erection of a joint fence, and in reply beg to state that I am prepared to agree to the fence suggested, but wish to avail myself of the provisions of Section 9 of the Fencing Ordinance 1904, and to pay the amount of my share of the cost by instalments with interest at the rate of 6 per cent. per annum, extending over a period of.....years.

Yours faithfully,

(See in reply Specimen *G.*)

D.—Notice in Gazette and Newspaper calling on owner whose address is unknown to contribute.

To A. B,, owner of farm..... situated in the District of.....

Take notice that I intend to fence my farm..... and in terms of Section 5 and 11 of the Fencing Ordinance

1904 I hereby call upon you to contribute towards the cost of construction of the fencing of our common boundaries from.....to.....

(Sgd.) C. D.

E.—Letter to person occupying hitherto vacant land which has been fenced.

Dear Sir,

I beg to inclose herewith copy of a Magistrate's Order dated..... authorising me to construct a dividing fence between farm..... now occupied by you and farm..... of which I am the owner, and in terms of Section 11 of the Fencing Ordinance 1904 have to call upon you for payment of half the present value of the said fence, which I estimate at £.....

Yours faithfully,

F.—Letter calling on neighbour to assist in repairing a boundary fence.

Dear Sir,

I beg to inform you that the boundary fence dividing our farms..... and is out of repair (*here state nature and extent of damage*). I therefore beg to call upon you to assist in repairing the same in terms of Section 15 of the Fencing Ordinance 1904.

Yours faithfully,

G.—Letter calling upon neighbour to pass Mortgage Bond.

Dear Sir,

I beg to acknowledge your letter of..... (see specimen *C.*) and note that you wish to pay your share of the cost of our joint fence by instalments. I am agreeable to this provided you pass a mortgage bond over your farm in terms of Section 29 of the Fencing Ordinance 1904 (*or other security can be arranged by mutual agreement*).

Yours faithfully,

H.—Letter to Registrar of Deeds notifying debt owing by neighbour for fencing.

Sir,

In terms of Section 30 of the Fencing Ordinance 1904, I have the honour to notify you of the undermentioned debt incurred in connection with a joint boundary fence between the farms.....and....., and to request you to register the same in the Register of Debts.

Name of farm.....

Amount owing.....

Situation and name of property in respect of which Bond has been demanded.....

Date of the grant or transfer of the said property to the said person.....

The above amount has been agreed upon, *or* ascertained according to law, and the person above named has been duly called upon to pass a mortgage bond and has failed to do so.

I am,

Your obedient servant,

Poultry.

HOW TO REAR TURKEYS.

By PHILIP L. HALL, Lenham Farm, Syringa.

By the time this article appears in print the turkey hen will either have commenced, or be in contemplation of laying her first clutch of the season. If success attend the farmer's efforts, the rearing of turkeys will be found one of the most profitable branches of the poultry industry. To attain this desirable result, a not inconsiderable amount of knowledge of the birds and their peculiarities is necessary. In the first place it is as well to remember that the turkey is about the only species of our farmyard that has failed to improve by domestication. The birds have become both smaller and more delicate and our American cousins have found it necessary to regularly introduce wild blood in order to keep up the stamina of their flocks. In-breeding in turkeys must be carefully avoided and attention must also be directed to the ages of birds selected to be bred from. In no case should either the male bird or hens be under two years of age and the male bird if from three to four years of age will procure stronger chicks.

The Turkey, although a familiar figure in the farmyard for so many generations, still retains many of the habits of the wild species, particularly in the breeding season when the hen will wander long distances to find a suitable place to lay her clutch. In order to prevent this, rough nests, preferably placed under trees or in a clump of bush as near the homestead as possible, should be erected. A thin framework of sticks with sheaves of long grass piled round and some dead branches placed over all will generally prove sufficiently inviting for the hen to deposit her eggs within. If an incubator be in use then the turkey can be induced to lay several clutches in the course of a season by removing the eggs and allowing not more than two dummy ones to remain in the nest. If a good number of broody fowls be about, these can also be used for hatching. But in the event of a large flock of turkeys laying about the same time, the incubator will be

found most useful. In most machines it will be found necessary to lower the frame within the drawer owing to the eggs being larger than those of the fowl. Practically the same treatment is necessary for the machine under these conditions as when filled with hens' eggs. One difference, however, I would call attention to, namely, the length of time the eggs should be cooled. Better results will probably be obtained if the eggs are cooled for a longer period night and morning, reducing the temperature to about 55 degrees twice a day.

Great care has to be exercised in rearing turkey chicks artificially as they are somewhat delicate, and consequently difficult to rear. Immediately they are dry—about twenty-four hours after they have made their exit from the shell—they should be removed to the brooder, the inner compartment of which requires to be kept during the first week at 90 degrees, gradually reducing it till during the second week it is about 80 degrees. Until the period known as "shooting the red" has passed, which occurs when the chickens are about eight weeks old, great care has to be exercised, as they are more delicate and more difficult to rear than ordinary chickens. Once this is over they are equally strong and hardy as ordinary birds, and require practically the same treatment. During the first three weeks the run attached to the brooder is sufficient for them in which to exercise, but after this time they may be allowed their liberty. Care should be taken not to allow them out on cold or damp mornings as wet is fatal. In cases where either the turkey hen or broody fowl is permitted to hatch, the site chosen for the rearing ground should be as dry as possible. Long grass must be avoided as when wet with dew or rain the chicks will wander through it until absolutely drenched. Fresh ground is also a great thing, for turkey chicks appear to be even more susceptible to fouled or "sickened" ground than other young stock. For the first week at least, it is wisest to keep the chicks inside a wire run attached to the coop.

Feeding is of course a very important matter, and if it were better understood much of the mortality which many turkey rearers complain of might be avoided. The diet for the first few days may consist of stale bread crumbs and oatmeal moistened with raw egg. The mixture must on no account be a sticky mass, but so mixed that it will crumble easily.

In addition to this greenstuff, prefeably chopped onion, must be given every meal. This is of the greatest importance, and if the green tops of onions, chives or shallots cannot be obtained, then the ordinary dried onion may be finely minced and chopped lettuce leaves added. After the third day egg food should be withheld, and rice boiled in separated milk may form the chief diet—the vegetable not being forgotten. Boiled N'youti may be given as a change diet. Curd, too, is a splendid food for young turkeys and they are very fond of it. The supply of animal food must be carefully regulated. If it is given in the form of "green" bone it must be used very sparingly, and those unaccustomed to rearing would perhaps be safer if they used ant eggs. If a piece of live ant heap be placed in the run the chicks will enjoy the white ants and a very excellent form of animal food is cheaply procurable. Charcoal or coal ashes broken small will be much appreciated by the birds and a good supply of grit is indispensable.

Throughout the rearing process and afterwards, the coop or whatever the night shelter may be, must be provided with an open-work door. The youngsters cannot stand an over-heated atmosphere, which invariably leads to pneumonia: vermin, to which young turkeys seem particularly susceptible, also causes great mortality. Ticks which attach themselves to the chickens, heads are the worst offenders, and the mites which come out of the crevices at night and suck the blood are almost as bad. If these pests are permitted to continue their depredations, ninety per cent. of the youngsters will succumb. A chicken weakened by the ravages of ticks may not only die of anaemia and loss of strength, but is liable to catch any passing disease, contagious or otherwise. Systematic lime washing of coops, or, better still, washing with Jeyes fluid, will prevent the mites from making their homes. If the ticks or sand fleas be noticed on the heads of the birds, a little butter or lard mixed with parafin oil and smeared over them will quickly rid the youngster of its unwelcome guests. Bowel troubles, such as diarrhoea, cause heavy losses among the young stock, but these may be avoided by providing a dry sleeping place, not over heated, and supplying wholesome food and plenty of good fresh vegetables. When the chickens have "shot the red," that is to say developed the red fleshy protuberances on their heads which

is the sign manual of the turkey—they are very hardy. Rain does not hurt them, in fact the only things we have to fear are snakes, jackals and similar creatures. Poults, as they are now called, should have a free range, and just as much to eat as they are inclined. They should be kept apart from the other poultry whenever possible, and should be accommodated at night in a shed with one side open to the air. They prefer sleeping out of doors and no harm will come to them from weather conditions. If they sleep in a closed house they catch cold almost invariably, and this develops into a form of roup peculiar to turkeys, which, for an obvious reason is called "swelled head." If they once catch this, it not only seriously retards their development, but is very difficult to to cure.

Turkeys will fatten best on a good variety of food, and if turned loose on freshly-ploughed ground will consume an enormous quantity of insect life, which is of great benefit to the farmer. With regard to the variety of breed best suited for the farmer, it is quite optional. The old theory of the white variety being the most delicate has been disproved years ago. There is of course the question of size, and undoubtedly the white variety cannot pretend to compete with the bronze in this respect. Nevertheless many consumers are prepared to pay more for the white on account of the greater delicacy of its flesh. The bronzed variety is the largest and the most profitable to keep for a market where only size counts. The Norfolk black also does very well out here, and when crossed with the bronze produces an excellent bird, and I strongly recommend this cross, especially in cases where the breeder has any doubt about his birds being related, as I previously mentioned, in-breeding must be avoided under any circumstances.

Cookery for the Country.

(By L. C.)

COLD MEAT SHAPE.

Butter a plain mould: chop up any kind of cold meat, add some hot stock, flavoured with pepper, salt, nutmeg, and lemonjuice, and with about 3 oz. of gelatine melted in it (the gelatine must be previously soaked for 20 or 30 minutes in cold water, enough to just cover it): have some hard-boiled eggs cut in quarters to garnish the mould: pour the mixture in, and turn out when cold.

SASATIES OR KEBOBS.

Cut up the thick part of a leg of mutton into pieces an inch square. Mince a raw onion and some lemon or orange leaves, one tablespoonful brown sugar, and half a cup of milk, mix well and pour over the meat. Fry 3 or 4 onions chopped small with a spoonful of butter or fat to a nice brown, add half a cup of vinegar, or the juice of three lemons, to the fried onions, and let the whole boil; then add 2 spoonfuls of good curry powder or curry paste, and some salt, mix well and pour over the meat. Do this overnight. Next day put the pieces of meat on skewers, fat and lean alternately, and grill over a clear fire. Put all the sauce in a saucepan in which a piece of butter has been previously melted, boil up and strain. Serve with rice.

SHRIMPS IN TOMATO CASES.

Take six nice tomatoes, cut in halves, remove the pulp and drain. Melt two tablespoonfuls of butter in a saucepan, and cook two slices of onion in it until slightly brown: remove the onion, add the tomato pulp to the butter, and cook until reduced to one-half: then add one cup of fresh bread crumbs, mix, remove from fire and add one-quarter cup of cream, and a tin of shrimps, and season well with salt and cayenne. Fill the tomato cases with this mixture, sprinkle over bread crumbs and bits of butter and bake in a quick oven until nicely browned on top. Serve hot or cold, if cold on a bed of lettuce.

HARICOT OF TINNED BEEF.

Soak a pint of haricot beans overnight: next day put them in two quarts of fresh water and boil for about two hours, or until quite tender, but not broken. Drain the water away from them (this liquor, by the way, makes an excellent foundation for soup, and is most nourishing), and let them stand with the lid of the saucepan lifted, near the fire, to dry, then stir in a good sized lump of butter, and pepper and salt to taste. Into another saucepan put 1 oz. butter, and when melted fry in it two onions, sliced finely, until slightly brown. Mix gradually with half a pint of stock or gravy (or the liquor in which the beans were boiled, with a spoonful of Bovril added is excellent), a tablespoonful of ground rice, and add a small carrot and turnip chopped small, a wineglassful of port or pontac, a tablespoonful of Worcester sauce, and a little pepper and salt; add to the butter and onions, and simmer all together for half an hour. Then open a tin of beef, cut it into neat squares or oblong fingers, dip each in flour, and put them into the gravy, for about six minutes, or until the meat is heated through. Dish in the centre of a somewhat deep dish, with the haricot beans all round.

CURRIED EGGS.

Melt in a saucepan two tablespoonfuls of butter, add one tablespoonful finely chopped onion, four tablespoonfuls finely chopped sour apples, and one tablespoonful of curry powder, and stir until the onion and apple are quite cooked. Then add two tablespoonfuls of flour, and a pint of milk, stirring all the time, and when smooth and thick, add half a dozen hard-boiled chopped eggs. Let the whole stand over a vessel of boiling water for fifteen minutes, then serve with fingers of toast round.

EGG RISSOLES.

6 eggs,
1 tablespoonful chopped parsley,
2 tablespoonfuls cream,
1 tablespoonful wheatmeal biscuit crumbs.

Boil the eggs hard, shell them, and rub the yolks smooth in a basin with the parsley, some pepper, salt, and a pinch of mixed herbs powder, the crumbs and the cream. Put the whites through a meat grinder, and add to the mixture.

Use just as much beaten yolk of egg as will bind the mixture, and form into small round cakes. Dip these in the rest of the beaten egg, then in fine breadcrumbs, and fry in boiling fat.

EGGS AND BREAD SAUCE.

(A Good Breakfast or Lunch Dish.)

Boil an onion cut in half in a pint of milk ; then remove the onion, and while the milk is boiling stir in enough fine white breadcrumbs to make it of the consistency of thick cream. Stir in a good tablespoonful of butter, flavour well with pepper and salt, and turn into a baking dish. Slip six eggs carefully on top and bake in a hot oven until set.

CARROT SAVOURY.

Steam some carrots and rub through a sieve, enough to make half a pint of pulp, add a large baked potato, also rubbed through the sieve whilst hot, then half an ounce or so of butter or good dripping, an ounce of flour, mixed smooth with a spoonful of milk or stock, and salt, pepper, and some chopped parsley, and mix all well together. When quite cool, beat in the yolks of three eggs, and lastly add the stiffly beaten whites of four eggs. Grease a baking dish and strew over some fine breadcrumbs, shaking out the loose ones, pour in the mixture, shake a few more crumbs over the top, and put little bits of butter over, and bake in a moderate oven.

FRIED BEETROOT.

(A Breakfast Dish.)

Peel some boiled beetroot, and cut into slices about a quarter of an inch thick. Dissolve 2 ozs. of butter in a frying pan, place in the beetroot, and fry for 20 minutes, sprinkling each slice on both sides with salt and pepper mixed. When done arrange the slices in a shallow dish. Place the pan on the fire again, adding a little more butter if necessary, stir in a tablespoonful of flour, and, when thoroughly mixed with the butter and bubbling all over, a tablespoonful of vinegar (half ordinary and half Tarragon vinegar), and a tablespoonful of water, stir until quite smooth, pour over the beetroot and serve very hot.

Review.

VETERINARY MEDICINES—THEIR ACTIONS AND USES.

By FINLAY DUN.

Revised and edited be James MacQueen, F.R.C.V.S., and Harold Woodruff, M.R.C.V.S.

Printed at the Edinburgh University Press, for David Douglas, 1910.

The twelfth edition of this valuable and standard work has recently been presented, having been revised and edited by Professors MacQueen and Woodruff, of the Royal Veterinary College, London.

This book, always of the greatest use to veterinary students and practitioners, has been largely rewritten in order to bring it up to date. The editors, with the assistance of such undoubted authorities as Professor G. Sims Woodhead and Professor Lander, D.Sc., have succeeded in embodying most of the recent advances in veterinary therapeutics in the present edition.

The work may be too technical for the average Rhodesian farmer, who will find it difficult to recognise many of his much favoured "nostrums" when dignified by scientific names. Stockholm tar and paraffin are dealt with, but he will note with regret the absence of any reference to brick-dust or axle-grease.

At the end of the book is found an index with hints as to the best lines of treatment to adopt. This alone should prove of the greatest value and should justify the expenditure of 15s., the price at which the book is published.

L. E. W. B.

Dates of Meetings of Farmers' Associations, Southern Rhodesia

(SUBJECT TO ALTERATION).

Name of Association.	Place of Meeting.	Secretary.	1910.				
			Aug.	Sep.	Oct.	Nov.	Dec.
Mashonaland	Salisbury ..	W. H. Williamson ...	6	3	1	5	3
Rho. Landowners' Farmers'	Bulawayo ...	Harry Hopkins ...	25	29	27	24	29
Manica	Umtali	P. B. Snashall ...	6	3	1	5	3
Midlands	Gwelo	M. L. Price ...	...	...	...	...	...
Lomagundi	Eldorado Mine ...	A. Smith	13	10	8	12	10
Makoni	Rusapi	F. A. Lapham ...	10	14	12	9	14
Marandellas	Marandellas ...	C. M. Wright	0	...	1	...	3
Matopos	Matopos... ...	W. E. Dowsett ...	...	4	...	...	4
Plumtree	Plumtree ...	J. Reid-Rowland ...	...	...	6	...	...
Victoria (Eastern)	Good Hope Farm	F. A. Readman ...	6	...	...	5	...
Enkledoorn	Enkeldoorn ...	A. J. Liebenberg ...	27	24	29	20	31
Figtree	Figtree	J. T. Kirschbaum ...	...	...	8	...	...
Melsetter	Melsetter ...	H. A. Oxenham ...	...	...	7	...	...
Gazaland	Chipinga ...	A. L. Sclater	4	...	...	3	...
Hartley	Hartley	S. J. Knutzen	0	10	8	5	10
Mazoe	Mazoe	V. W. Fynn	...	4	...	...	4
*Makwiro and Norton ...	Makwiro ...	W. Shaw	...	...	...	...	...
*Macheke	Macheke ...	A. C. Fountain ...	...	...	...	...	...
*Victoria	Victoria	James Rutherford ...	...	...	...	...	...
*Kimberley Reefs	Kimberley Reefs ...	G. O. Smith ...	...	...	...	...	...
*Somabula	Dewhurst, Somabula	S. Annandale ...	...	...	...	...	...

Dates of Meetings of Associations marked (*) are uncertain.

Correspondence.

FLY DISEASE.

THE EDITOR RHODESIAN AGRICULTURAL JOURNAL.

Sir,—On reading the interesting articles on "Trypanosomiasis," which appeared in your Journal recently, it occurred to me that an account of the principal symptoms of the disease, as I observed them in a herd of 20 imported cattle in Nigeria might be of interest.

These cattle were housed in open stables, and carefully watched by native herdsmen, who were never able to detect the presence of tsetse fly, the stables, however, were infested with stomoxys, which, in all likelihood, acted as carriers of infection. The first symptom, and one which is invariably present, is enlargement of the lymphatic glands; these glands may easily be felt and generally seen behind the shoulder, and in the flank they are not so evident, but may generally be felt at the root of the neck, the swelling is moderate, seldom exceeding in size that of a pigeon's egg, and the affected glands move freely under the finger. The next symptom is a swelling of the legs, immediately above the hoof, which swelling at first pits on pressure, but soon feels elastic; and extending between the roots of the toes causes a well-marked separation of them and gives the whole shank a clubbed appearance.

The teeth later became loosened, causing a disinclination in the animals to eat. Sometimes a whole limb, generally a fore-leg and shoulder become suddenly affected with a puffy swelling, lasting a few days, and gradually disappearing. The chest and belly are often similarly affected, especially in horses; in this case the swelling starts from each armpit and extends to the middle of the belly, where the swellings, distinct on the chest, spread out and join together, the scrotum, and in chronic case the testicles, especially in horses, also become dropsical.

The animals affected are generally emaciated, but sometimes preserve their condition. There is always constipation in cattle, and often towards the end retention of urine from

paralysis of the bladder. The breathing is generally panting, and sometimes the animals become drowsy before death. Occasionally temporary improvement occurs, but the disease in every case I observed was fatal.

The blood is sometimes swarming with trypanosoma, and at other times, for no apparent reason, free from the parasite, a very interesting thing as bearing on the sudden occurrence of oedema following the course of a vein, as in the chest swellings above noticed is, that often on puncturing a vein of the ear with the object of procuring samples of blood, the outline or the vein springs into prominence through being suddenly filled with clot extending perhaps half an inch on each side of the puncture; this is due to the extreme coagulability of the blood in the latter stages, and renders the taking of specimens often a matter of difficulty.—I am, etc.,

E. MOORE.

[Mr. Moore's interesting remarks do not coincide in many material points with Southern Rhodesian observation. The fly disease in question may be different to that which occurs here. Further correspondence is invited.—ED. R.A.J.]

CEARA RUBBER IN SOUTHERN MELSETTER.

THE EDITOR, RHODESIAN AGRICULTURAL JOURNAL.

SIR,—In reply to your query with regard to rubber, I may say that in present tapping experiments on 4½-year-old trees point to the conclusion that, after a few day's experience, with but slight selection of the better trees and with the aid of drip-tins, a native will obtain not less than 6 ozs. of dry rubber in a single day's work. This rubber is all in the form of thin biscuits, or sheets, of excellent quality. I have not troubled to collect the scrap, in which there is usually, in any case, very little.

I have found that a 3 per cent. solution of ammonia is very effective in preventing coagulation—one of the difficulties of the tapper of Ceara trees. One can thus obtain the latex and treat it generally like that of *Hevia*, finally coagulating it by he use of an acid.

Our local natives, quite contrary to my expectations, make excellent tappers.

I hope shortly to be able to let you have far fuller details in the form of a paper on the subject.

I am, Sir,

Yours, etc.

C. F. M. SWYNNERTON.

Gungunyana,
South Melsetter.

Market Reports.

According to the latest reports received London market prices remain practically unchanged, except in regard to wheat, the price of which has improved. It is doubtful whether the prices which have prevailed for the last two or three years will be realized again for some time.

The local market continues to be well supplied with produce grown locally and prices remain steady, except as regards to maize, the price of which has declined since last report.

The following are the latest market quotations received:—

Jas. Lawrence & Co. (Transvaal), Ltd., 7th July, 1910:—

Barley, per 150 lbs.	12/0	14/0
Beans, per 200 lbs.	15/6	40/0
Bran, per 100 lbs.	6/3	7/3
Chaff, per 100 lbs.	3/0	4/0
Forage (T'vaal), 100 lbs.	5/6	7/3
„ (O.R.C.) „	4/6	5/6
„ (Colonial) „	7/0	7/3
Hay, per bale	9d	1/-
Kaffir Corn, White, per 200 lbs.	8/6	9/0
do. Mixed	9/0	9/6
Lucerne, per 100 lbs.	4/9	6/3
Manna, per 100 lbs.	4/0	4/9
Mealies, (S.A.), White, per 200 lbs.	7/6	7/10
Mealies, (S.A.), Yellow, per 200 lbs.	8/0	8/10
Oats, per 150 lbs.	8/0	11/6
Onions, per 120 lbs.	8/6	10/0
Peas, per 200 lbs.	11/6	13/6
Potatoes, per 150 lbs.	6/6	13/0
Rye, per 200 lbs.	10/6	12/0
Salt, per 200 lbs.	4/2	4/9
Boer Meal, sifted, per 200 lbs.	16/0	27/6
Wheat, per 200 lbs.	16/0	19/6
Butter, per lb.	10d	1/4
Eggs, per dozen	1/0	1/4
Ducks, each	1/6	2/9
Fowls, each	1/0	3/6
Geese, each	3/6	4/6
Turkeys, each	3/0	10/0
Pigeons, each	6d	8d
Slaughter Oxen	£9	£12/10
Sheep, each	13/6	20/0
Pigs, per lb.	2d	4¼d

Hubert Morisse & Co., Johannesburg, 30th June, 1910:—

Barley, per 163 lbs	...	11/6	14/0	Lucerne, per 100 lbs	... 5/0	6/3
Bran, per 100 lbs, Colonial		6/3	7/3	Manna ... „	... 3/9	4/3
Chaff, best, 100 lbs	...	2/0	3/6	Transvaal Hay, bale	... 6d	1/2
Eggs, per doz, Colonial...		1/1	1/3	Oats, per 153 lbs...	... 7/6	12/6
Salt, per bag, 200lbs	...	4/3	5/1	Potatoes, best, per 153 lbs	9/6	12/0
Forage, Transvaal 100lbs		7/0	7/3	„ med. and inferior	7/0	9/0
„ Colonial, 100lbs	...	6/9	7/0	Onions, Cape, 120 lbs	... 9/0	10/0
„ med. & inferior „		3/6	5/6	Turkeys, Cocks ...	... 4/0	10/6
S. Meal, best fine, 203lbs		22/0	26/6	„ Hens ...	... 3/0	5/6
Rye, ... „		11/0	11/6	Fowls ...	 1/2	3/3
Wheat „		13/6	20/6	Ducks ...	 1/6	2/6
Mealies, Hickory King		7/8	7/10	Geese ...	 3/9	5/0
Mealies, O.R.C. Whites...		7/3	7/6	Pigeons ...	 7d	8d
Mealies, Yellow ...	...	7/10	8/1	Butter, O.R.C. ...	... 1/0	1/3
Kafir Corn, per 203 lbs	...	8/6	9/3	Pumpkins, each ...	... 3d	4d
Hay, Sweet, Transvaal...		9d	2/6	Beans, per 203 lbs, Sound	15/0	37/6

LIVESTOCK.

Slaughter Oxen ...	...	£9	£13/10	Pigs, live weight ...	... 2½d	4d
Slaughter Cows ...	...	£6/10	£7/15	Mules, large ...	... £25	£30
Milch Cows, Cape	...	£19	£35	Mules, medium ...	... £19	£22/10
Trek Oxen ...	...	£7	£7/15	Mules, small ...	... £17	£18
Sheep, Cape and Bastard	per lb	4¼d		Horses, good ...	... £16	£25
„ „ „	...	16/0	23/0	Horses, ponies ...	... £9	£13
Sheep, Merino, per lb	...	4¼d		Donkeys ...	... £5/10	£7
„ ...	...	16/0	23/6	Heifers, 12 to 18 months	£5	£6
Slaughter Ewes ...	...	12/6	16/0	Heifers, 2 to 3 years	... £6	£9
Lambs	...	9/6	13/0	Cows, breeding ...	... £7	£9/10
Goats, Boer Kapaters	...	13/6	19/0			

Jas. Lawrence & Co., Ltd., Kimberley, 8th July, 1910:—

Bran, per bag 100 lbs	...	6/0	6/6	Wheat, per bag 203 lbs	... 18/6	20/0
Barley, per bag 163 lbs	...	9/6	12/6	Butter, fresh, per lb	... 1/0	1/3
Beans, Sugar, bag 203 lbs		28/6	30/6	Butter, second quality	... 9d	10d
Beans, Kafir, 203 lbs	...	13/6	15/0	Eggs, per dozen ...	... 1/1	1/4
Chaff, Colonial, bale	...	6/6	9/6	Ducks, each ...	... 2/0	2/6
Chaff, Colonial, pressed, 100 lbs	...	3/0	3/6	Fowls, each ...	... 1/0	1/4
Forage, good, per 100 lbs		5/9	6/3	Turkeys, each ...	... 3/6	7/0
Kafir Corn, S.A., mixed		8/6	9/6	Salt, per bag ...	... 3/0	4/6
Kafir Corn, White	...	8/6	9/6	Lime, per bag ...	... 3/0	4/0
Boer Meal, Colonial, unsifted	...	23/6	26/6	Guavas, per tin ...	... 1/0	2/0
Boer Meal, Colonial, sifted		26/6	29/6	Guavas, per box ...	... 1/0	3/0
Flour, Colonial, per bag 100 lbs	...	15/6	16/6	Guavas, per basket	... 2/0	3/6
Yellow Mealies, Colonial, 203 lbs.	...	9/0	9/6	Oranges, per 100...	... 2/0	4/6
White Mealies, Colonial, hard, 203 lbs ...	...	8/0	8/6	Beans, green, per lot	... 2d	4d
White Mealie Meal, 183 lbs		9/0	9/6	Cabbages, per dozen	... 6d	3/0
Oats, per bag 150 lbs	...	9/6	10/6	Cauliflowers, per doz	... 6d	4/0
Lucerne Hay, per 100 lbs		5/0	5/6	Pumpkins, per doz	... 3/6	7/6
Onions, per bag 120 lbs...		5/0	8/6	Springbok, each	... 10/6	20/0
Potatoes, ...		5/0	13/0	Stembok, each ...	... 4/0	6/6
Tobacco, good, per lb	...	4d	7d	Duikers, each ...	... 6/0	10/0
Tobacco, inferior, per lb		1d	2d	Hares	... 9d	2/0
				Paauws	... 4/0	12/6
				Redwing	... 9d	1/3
				Koorhaan... ...	... 1/0	1/3
				Guinea Fowl ...	... 2/6	4/0
				Namaqua Partridge, doz	3/0	4/6

SLAUGHTER.

Cows, good, 450 lbs upwards	£6 10	£7 10
Calves	£2	£2 10
Oxen, good, prime, 600 lbs upwards	£9	£10 10
Oxen, Trex	£6 10	
Cape Sheep, good	11 6	13 0
Lambs, 30 lb	7 6	8 6
Hamels, 40 lb to 45 lb	10 6	13 0
Kapaters, good, 60lb	13 6	15 0
Horses Riding & Draught	£10	£20
Mules	£20	£22 10
Donkeys, Geldings	£4 10	£6
Donkeys, Mares	£5	£6 10
Pigs, (clean), per lb	3d	3¼d

Whitfield & Co., Salisbury, 25th July, 1910.

Cows, good milkers	£25	£35
Cows, Native	£8	£10
Heifers, Colonial	£7	£8
Heifers, Native	£5	£6
Trained Oxen, large		£12
Trained Oxen, ordinary		£10
Mules, inoculated	£30	£35
Mules, not inoculated	£25	£30
Horses	£25	£30
Donkeys, Colonial	£8	£9 10
Donkeys, G.E. African	£8	£9
Sheep, Colonial		25 -

Wightman & Co., Ltd., Salisbury, 26th July, 1910:

Mealies, per 203 lbs	8 0	8 6
Rapoko, per 203 lbs	9 6	10 6
Oat Forage, per 100 lbs	10 0	12 6
Onions, per lb	2½d	
Potatoes, per lb	¾d	1d
Munga, per 203lbs	11 0	12 0
Salt, per 200lbs	19 0	
Manna Hay, per 100lbs	6 6	7 6
Beans, per 200 lbs	17 6	
Monkey Nuts, shelled, p. lb	1¾d	
do. unshelled, per 83 lbs	8 6	
Wheat, per 200 lbs	30 0	
Oats, per 153 lbs	29 0	

Agricultural Reports for May and June, 1910.

As is usual at this time of year, the labour supply has somewhat improved, but there is still a deficiency in certain districts. The delay in arrival of Nyasaland boys, owing to unforeseen circumstances, has caused considerable inconvenience; farmers relying very much on this source for their manual labour.

Throughout the northern portion of Mashonaland the crops, though somewhat late, were plentiful and sound. Native crops are abundant, while of European crops also there will be no deficiency, although some extra late mealies were injured by early frosts. In the south the crops were anticipated to prove lighter, but improved later, so that everywhere the yield may be expected to be above the average. The early frosts appear to have adversely affected the late ripening crops in Matabeleland, yet not to such an extent as to occasion any shortage or want, although the surplus will not be large as regards native crops. Crops are reported to be deficient in Matopos and poor in Bulawayo, somewhat below last year's yield in Gwelo, average in Tuli, Bulalima, Mangwe, and Enkeldoorn, fair in Belingwe, Bubi, and Wankies, and elsewhere very good. In Insiza only a half crop of Kaffir corn is reported, but rapoko is fair, while European crops of mealies, beans, and potatoes surpass all expectations.

A number of new settlers have of late entered the Enkeldoorn district, bringing with them livestock, wagons, and implements, and everything ready to start active operations on a reasonable scale, and being men of practical experience and substance, are likely to do well and be an acquisition to the country.

The season of veld fires is now on. In the Insiza district steps were early taken by both natives and farmers to burn fire lines, and so secure the veld from total devastation.

Fencing is likely to be embarked upon to a much greater extent than hitherto. The application of the Fencing Ordinance to a large portion of the Salisbury district is a

wise move, which might with advantage be followed in the surrounding areas, where most of the farms are beneficially occupied and heavily stocked.

Native stock fortunately continues healthy, the cattle of only one native being implicated in the various outbreaks of Coast Fever now in existence.

Late rains favoured the winter veld, and stock enter upon the cold season in good condition and general health.

It is apt to be overlooked that the spread of disease is much more easy now than formerly, owing to the fact that the country is dotted with numerous herds, whereas in the early days the distances separating cattle were very much greater.

A quarantine area has been set aside north of Sipolilo, on the edge of the escarpment for the reception of cattle from Nyasaland and North-Eastern Rhodesia. The recent appointment of veterinary officers to these territories should be a material gain to Southern Rhodesia, giving a measure of security and reliability to the certificates of health which are now required for all cattle brought down from the north.

In the Charter district a pack of lions caused considerable damage, killing over 50 head of cattle within six weeks. In Tuli-Gwanda district, a pack of wild dogs has been doing much destruction in one month, killing 30 sheep, one cow and calf.

Veterinary Report for the Months of May and June, 1910.

SALISBURY.

AFRICAN COAST FEVER.—In continuation of the report published in the June number of the "Agricultural Journal," it has now further to be chronicled that on the 1st May at the Brickfields centre a beast in a small herd, close to Mr. Dardagan's kraal, the property of Mr. Hetherington, died, and although post-mortem appearances did not indicate Coast Fever, microscopic examination of blood and spleen smears showed that the piroplasma parva and Koch's granules were present. The rest of the herd was subsequently destroyed, six on showing high temperatures and one healthy beast. On the 15th May a beast in Mrs. Emerick's herd, on the south side of the Makabusi, between the Brickfields and Hillside, was destroyed, microscopic examination of blood smears showed that the animal was infected with Coast Fever; two were destroyed on showing high temperatures, and the remainder of the herd disposed of to the butcher. During the process of slaughtering these animals, one cow escaped, and was subsequently found at Mr. J. A. Edmond's farm Glen Lorne; fortunately it was found to be healthy, post-mortem examination and microscopic examination of blood and spleen smears alike failed to show the slightest suspicion of Coast Fever or other disease.

On the 27th May a report was received from Mr. Kirkman, of Stamford farm, nine miles west of Salisbury, that several of his cattle were sick. On inspection, the same afternoon, the Chief Veterinary Surgeon found a very serious state of affairs, there had been several deaths during the previous fortnight, several animals were in the last stage of disease, and many showed slight signs of illness. A cow and calf were destroyed, in each case the post-mortem appearences whilst suspicious were not by any means characteristic of Coast Fever, however, microscopic examination of blood and spleen smears showed that Coast Fever existed. As far as can be gathered, about ten head, mostly calves, had died

before the outbreak was discovered, from then until the end of June, 27 were destroyed, twelve died, and 23 were slaughtered.

It is difficult to account for the outbreak. There is no doubt that infection existed for a considerable period on the farm before it was discovered. The first death amongst the calves occurred about the beginning of the year; the owner attributed the calf mortality to Calf disease, *i.e.*, white scour. From this record and from the large number of animals affected at the date of first inspection, there is reason to believe that the disease existed at Stamford prior to the Brickfields outbreak, but where the infection came from in the first instance is still a mystery.

At Gletwyn the cattle were removed from the infected portion of the farm to the lower end, which is as far as we know clean, and four animals were destroyed as showing high temperatures. Some bullocks remained on the infected area, but these have since been slaughtered. The farm has been fenced and the infected area divided from the clean portion by a cross fence.

From the Brickfields-Makabusi area 60 head were moved to Letombo temperature camp; after removal one calf was destroyed on showing a rise of temperature. There still remain 20 head on this area, but these will be shortly removed to the Letombo Camp, under the same conditions. One hundred and twenty-five oxen were similarly removed from Hartman Hill to a temperature camp on Borrowdale.

All the centres in Salisbury District in which disease has occurred, viz., portion of the Commonage, Gletwyn and Stamford are now fenced. The whole of the Commonage is also enclosed and divided into four areas by sectional fences. The Hillside and Avondale dipping tanks are now in use, all the cattle on the Commonage are dipped once every fourteen days.

MALLEIN TEST.—Eleven horses and eight donkeys were tested on importation and found healthy.

BULAWAYO.

AFRICAN COAST FEVER.—On the 25th May the Veterinary Department, Bulawayo, was advised by Mr. Rorke, Crocodile Valley Farm, Mzingwane district, that four head of his cattle

were dead and ten sick. On inspection the following day Mr. Sharpe, G.V.S., reported that he had no doubt that Coast Fever existed, which opinion was subsequently confirmed by microscopic examination of spleen and blood smears. On 30th May a case of Coast Fever was discovered at Matshya's kraal, about five miles from Crocodile Valley and on the road between this farm and the Limes Mine. At the Limes Mine, about 13 miles from Crocodile Valley, Mr. Rorke had some oxen, three of these showed signs of sickness and were destroyed by the owner.

A large staff, consisting of officers of the Veterinary Department and Police was despatched to deal with the outbreak, fortunately there are several long fences in the district, viz., the old Mzingwane infected area fence, the Matabele Reefs fence on Copthall Block and the fence around Col. Napier's farms. Police posts were established between these fences, a very extensive area around the infected centres is thus guarded. A fence to join the Mzingwane and Copthall Block fences is being erected, and arrangements are being made with the farmers concerned for the completion of the fencing on northern and western sides of the dangerous area.

The cattle at the Limes Mine and Matshya's kraal were removed and placed within the infected area at Crocodile Valley. The mortality to end of June was as follows :—

Mr. Rorke's ...	...	...	91 head
Matshya's ...	...	...	4 head

The source of infection in this outbreak is just as unexplainable at present as in the cases of the Marandella and Salisbury outbreaks. The old Mzingwane infected area is about 17 miles from Crocodile Valley, but in this area only one case of Coast Fever occurred since January, 1908. This case was one of the test cattle placed at the old sick camp in April, 1909, to prove whether infection existed or not, after a few weeks exposure the animal showed a rise of temperature and was isolated in a kraal until death. Postmortem and microscopic examination showed that cause of death was Coast Fever. The kraal and surrounding veld was burned and it is impossible to imagine any infected ticks remaining to have been the cause of the outbreak at Crocodile Valley, especially as the sick camp is a considerable distance within the fence, and between the fence and Crocodile Valley there

are large herds of European and native cattle. It has been suggested that infection was brought from the Transvaal by means of cattle illicitly introduced. This is very doubtful for while it is known the cattle have been brought in from the Proctectorate, which is free from Coast Fever, it seems impossible for cattle from the Transvaal to have brought infection so far into the territory without leaving infection en route which must have shown itself before this. The nearest point of infection in the Transvaal is about 200 miles from Crocodile Valley. It is possible for an animal to contract infection and be driven this distance before the disease develops to that stage at which it is capable of being transmitted by the ordinary vectors, but we know that when cattle are illegally introduced they are kept at some cattle post or native kraal for some time before being moved on, and in most cases several permits for their removal are applied for before they reach their ultimate destination. It is at these intermediate depots that infection brought from the Transvaal would be found.

It is somewhat suggestive that in the Marandella, Stamford, Salisbury and Essexvale outbreaks, in each case the herds first infected contained old salted cattle.

MALLEIN TEST.—The following animals were tested on importation:—

Horses ...	... 648
Mules ...	... 782
Donkeys ...	... 888

One horse reacted and was destroyed, and one horse and mule, detained for a second test, failed to react and were released.

UMTALI.

AFRICAN COAST FEVER.—The test of the Raheen and Quaggas Hoek infected centres has been satisfactorily completed, and the Police cordon is being withdrawn to a smaller circle round the Imbezi Valley.

IMPORTATIONS.—Ninety head of slaughter cattle.

HARTLEY.

A case of fly disease was discovered in an ox belonging to Mr. Woodford, farm Lanteglos. This beast had been lost for some days and developed the disease subsequent to its return.

VICTORIA.

RABIES.—A rabid dog was destroyed at St. Joseph's Mission. A horse bitten by this animal developed symptoms of Rabies some time afterwards and was destroyed.

Except a few cases of Scab no contagious disease is reported from the other districts in this territory.

GENERAL.—The mortalily from Horsesickness was very heavy, especially towards the end of June, many old acclimatised animals succumbed.

A few cases of Strangles occurred, and a severe form of Catarrh of the Respiratory Organs has been prevalent throughout the country.

J. M. SINCLAIR,
Chief Veterinary Surgeon.

Weather Bureau.

Temperatures Recorded, 1910. (Means).

	MAY.		JUNE.	
	Max.	Min.	Max.	Min.
Bulawayo	73.3	44.4	69.1	44.3
Chishawasha	75.1	45.0	70.5	43.3
Empandeni	76.1	42.8	72.7	40.2
Gwelo	73.5	39.9	69.8	40.0
Hope Fountain	72.1	48.6	68.5	43.8
Melsetter	70.8	...	64.3	...
Plumtree	...	...	...	...
Salisbury	74.3	43.3	70.2	42.0
Umtali	75.2	31.5	76.1	30.0
Belingwe	...	...	...	...
Gwanda	77.1	43.7	71.2	39.5
Rhodes Matopo Park ...	73.6	41.8	70.1	40.8
Selukwe	...	...	...	...
Tuli	82.6	...	77.0	...
Victoria	73.6	42.3	71.6	42.1
York Farm, Inyanga ...	68.1	45.7	...	...
Victoria Falls	81.1	43.6	77.6	41.5
Hartley	78.4	42.1	75.0	41.8
Gadzema	78.8	48.7	77.0	46.7

Records received of Rainfall at Stations in Southern Rhodesia, 1910.

	May	June
MASHONALAND -		
Brundret, Mazoe	Nil	.06
Battlefields	—	
Banket Junction	—	—
Borrowdale		
Charter (Range)	.15	
Chilimanzi		
Chishawasha	—	.03
Driefontein	.05	.15
Eldorado	—	—
Enkeldoorn	.23	
Eagles Nest	—	.13
Gadzema	—	—
Gatooma	—	—
Gutu	.24	.18
Hartley	—	—
Helvetia		
Inyanga (B.S.A.P.)	—	.05
Inyanga (York Farm)	.47	
Lone Cow Estate	—	.03
Marendella	—	.06
Monte Cassino	—	.06
Macheke	—	—
Mount Darwin	—	.03
M'Rewa	—	.14
Melsetter	.45	1.35
Mazoe South	—	
M'Toko		—
Morgenster	.26	
Rusapi	—	—
Salisbury	—	—
Sinoia	—	
Sipolilo	—	
Stapleford		
Summerfield, Penhalanga ...	.10	.98
Utopia	.25	1.60
Umtali	.22	.59
Victoria	.06	
West Ridge	—	

	May	June
MATABELELAND—		
Balla Balla		—
Bembezi		—
Bulawayo (Observatory) ...	.02	.03
Bulawayo (Govt. House) ...	.01	
Belingwe		
Empandini		
Filabusi		
Fort Rixon	.04	.03
Gwelo	.01	.05
Gwanda	.27	.01
Gwaai		—
Heaney Junction	—	.03
Hope Fountain		.18
Inyati		
Insiza	—	—
Kariangwe		
Malindi		—
Maxim Hill	—	—
Matopo Mission	.02	.05
Nyama Ndhlovu		—
Plumtree		
Que Que		.05
Rhodes Matopo Park		
Selukwe		1.21
Shawlands		.07
Syringa		
Solusi		.01
Tegwani	—	—
Tuli	.10	
Umguza	—	.09
Umshabetsi Mission		
Victoria Falls		—
West Nicholson		—
Wankies		—

OBSERVERS' NOTES.

EAGLES NEST—June.—Farmers in this district are earnestly endeavouring to prevent grass fires.

GUTU—May.—The natives are busy reaping a fair crop. Frost heavier than usual has been reported. Weather generally very cold.

M'REWA.—May.—There was a good deal of frost in the early part of the month. The veld is now getting very dry and grass fires will soon commence. Harvesting is in full swing all over the district with the exception of part of the north end of the district. Crops are up to the average and in many places beyond the average. Rivers and springs in the north end of the district are very low, and in some places the springs have dried up, but in the south end of the district rivers have almost a normal flow for this time of the year.

SUMMERFIELD—May.—Europeans commenced reaping maize crops on the 10th. Kafir mealies are late and poor, while rokweza is a little better, but only half a crop at best. Streams are running unseasonably low.

FORT RIXON—June.—Farmers are hard at work reaping crops, which are late this year. Stock is keeping in condition and not shewing any symptoms of disease.

UMSHABETSI MISSION—May.—The natives are busy gathering their grain crops, which are fair, but not as good as last year. There are scarcely any beans. All cattle doing well.

Departmental Notices.

CHEMICAL ANALYSIS OF AGRICULTURAL PRODUCTS.

Arrangements have been made for the chemical examination of soils, limestones, grain, and other produce, oil-seeds, cream, milk, water, fertilisers, etc., on behalf of farmers and others by the Chemist attached to the Department of Agriculture. Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analysis, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

INQUIRIES.

Farmers are reminded that in all matters relating to agricultural practice, soils, crops, processes and kindred matters, advice is given by the Department in response to inquiries made by them individually.

In particular subjects, such as disease among crops, insect pests and the like, specimens should be sent to the Department, together with as full details as possible.

Advice will be given to farmers who want farm machinery and appliances, seeds, trees, e c.

All communications should be addressed in the first instance to the Director of Agriculture, Salisbury.

SAMPLES SENT TO THE DEPARTMENT OF AGRICULTURE.

Parcels are constantly being received for one purpose or another addressed to this Department, very often without and indication of where they are from or why they were

sent, and it is difficult in such cases to trace the sender.

It is earnestly requested that farmers and others will mark distinctly on the packages their names and addresses so as to enable their requirements to be attended to without delay.

MULBERRY CUTTINGS.

Mulberry Cuttings, f.o.r. Salisbury, 5/- per 100. Apply, to the Agriculturist.

TOBACCO SEED.

All enquiries for tobacco seed should in future be addressed to The Manager, Rhodesia Tobacco Warehouse, at Salisbury or Bulawayo.

TOBACCO SEED BED COVERING.

A large supply of calico for covering tobacco seed is now available. It can be obtained from the Anglo-African Trading Company, at Salisbury, Bulawayo and Gwelo.

Price, 2½d. per square yard

DISPOSAL OF SEEDS.

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

POISONOUS PLANTS.

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of

Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem leaves, flowers, and, where possible, fruit. Any particulars regarding the habits of the plant, will be welcomed, and in return the Department will supply all available information regarding the plants.

BOTANICAL SPECIMENS FOR IDENTIFICATION.

In all cases where a botanical identification is required it is of the utmost importance that the specimens reach this office in a thoroughly dry condition, free from mildew and intact, that is not broken in pieces. Whenever possible specimens should comprise main stem or small branch, leaves flowers, seed vessels and roots and bulbs, though these need not necessarily be on the same plant.

The colour of the flowers and the general form of the plant should be preserved by pressing and drying between two sheets of blotting paper or newspaper. Ordinary plants not excessively succulent can be dried sufficiently in three days, provided the drying papers are changed every day. A moderately light weight should be placed on the dryers in order to press the specimens flat.

Correspondents are asked to supply the following particulars as far as possible.

(a) Height and general appearance of plant or tree.
(b) Class of soil found on.
(c) Locality and altitude.
(d) Supposed use or properties.

It is advised that specimens be packed between two sheets of cardboard or thin wood, since in this way they will travel long distances without fear of injury.

DESTRUCTION OF WILD CARNIVORA, ETC.

It is hereby notified for public information that the rewards for the destruction of wild carnivora, etc., will be paid only on the scale and conditions herein set forth:

2. Rewards will be paid as follows:—

For each Lion	£3	0	0
„ Leopard	£1	0	0
„ Cheetah	£1	0	0
„ Wild Dog	£0	10	0
„ Crocodile, of not less than 3ft. in length	£0	10	0

3. Rewards will be paid to Europeans by the Magistrate or Native Commissioner, and to natives by the Native Commissioner of the district, within three months of the date upon which the animal is killed, on a prescribed declaration form.

4. In proof of destruction, applicants for rewards will be required to produce and surrender, in the case of the Lion, Leopard or Cheetah, the skin with the tail not severed, and in the case of the Crocodile or Wild Dog, the unskinned head.

5. The skins and heads of animals for which rewards have been paid shall be the property of the Government, and shall be disposed of in such manner as may be decided on.

GOVERNMENT ASSISTANCE IN THE PURCHASE OF STUD STOCK.

Arrangements have been made whereby farmers may purchase pure bred stock through the Department of Agriculture.

Besides securing the benefit of the most competent judges to select the animals, whether in South Africa, England or Europe, purchasers are enabled to make payments by instalments spread over a period of one year.

Recent purchases include 14 bulls and 46 heifers, comprising Shorthorn, Friesland, Devon and Afrikander breeds; 180 Persian sheep, and a small number of pigs. Applications for high-class stud stock only will be entertained.

For full particulars application should be addressed to the Director of Agriculture, Salisbury.

LOANS FOR FENCING PURPOSES.

The B.S.A. Company is prepared to advance funds to any owner of a farm beneficially occupied by a white person, to provide fencing material, on the following conditions:

1. The full cost of the material at nearest station or siding will be advanced, in no case exceeding the sum of £200.
2. Payment shall be made in ten equal annual instalments, or less if the applicant desires, together with interest at 5 per cent. per annum, payable in July, but no repayment will be called for within one year of granting the loan.

3. The applicant will be required to furnish personal security to the satisfaction of the Board, or to pass a first mortgage bond over his farm as security for the loan.

4. The loan only applies to fences erected on the boundary of properties, not to internal fencing.

The loan will be made on completion of fence, and subject to inspection by a representative of the company.

The fence may be erected to any pattern approved by the Board, but for guidance the following minimum requirements will normally be insisted upon :—

Straining posts not further than 440 yards apart; standards not farther than 45 feet apart; droppers or lacing not further than four yards apart; if no droppers are used standards should not be more than 20 feet apart. If wooden strainers, standards or droppers are proposed to be used, the kind is to be specified.

Applications stating the situation and mileage, and furnishing specifications of fence proposed to be erected, and accompanied by firm and detailed quotations for the material required and cost at nearest station, must be addressed in the first instance to the Director of Agriculture, Salisbury.

Preference will be given to farmers in areas which have adopted Part I. of the "Fencing Ordinance, 1904," but all applications will be considered.

Farmers are invited to submit applications for the consideration of the Fencing Board to the Director of Agriculture, Salisbury.

DEPARTMENTAL BULLETINS.

The following Bulletins on special subjects, consisting mainly of reprints of articles which have appeared in the Rhodesian Agricultural Journal, are available for distribution free of charge to applicants in Rhodesia:—

Terms of Analysis of Agricultural Products, Soils, Water, etc., (compiled).
Bots in Equines, by R. Ferguson Stirling, M.R.C.V.S.
Broomcorn, by H. Godfrey Mundy.
Cotton Cultivation, by J. L. Stinson.

"Foul Brood" in Bees, by Rupert W. Jack, F.E.S.
Fencing Ordinance, 1904, (compiled).
Farm Science, by J. E. Wing and others.
Government Aid in Fencing, (compiled).

The Ground-nut or Pea-nut, by H. Godfrey Mundy.
Interim Report on the Animal Trypanosomiases of Southern Rhodesia, by Ll. W. E. Bevan, M.R.C.V.S.
Importation of Plants, etc., Regulations, by Rupert W. Jack, F.E.S.

Maize Growing, by H. Godfrey Mundy.
Malaria, by A. M. Fleming, C.M.G., M.B., F.R.C.S. (Ed.), D.Ph. (Camb.).

Prevention and Treatment of Blackwater Fever, by A. M. Fleming, C.M.G., M.B., F.R.C.S. (Ed.), D.Ph. (Camb.).

The Possibilities of Rhodesia as a Citrus Growing Country, by R. Mellwaine, M.A., L.L.B.

The Potato Tuber Moth, by Rupert W. Jack, F.E.S.

Special Rates for the Benefit of the Farming Community in Southern Rhodesia, (compiled).
Tobacco, by G. M. Odlum.
The Tsetse Fly, by Ll. E. W. Bevan, M.R.C.V.S.
The Time and How to Find it, by Rev. Father Goetz, S.J.
Winter Feeding of Farm Stock, by H. Godfrey Mundy.

Wireworm or Hairworm in Melsetter District, by E. M. Jarvis, M.R.C.V.S.
Flax, Linum usitatissimum, by C. E. F. Allen.
Brief Notes on Blood Sucking Flies, by R. W. Jack, F.E.S.
Accidents to Calves after Calving, by J. M. Sinclair, M.R.C.V.S.

Ensilage, by H. Godfrey Mundy.

The Conservation of Kraal Manure, by H. Godfrey Mundy

Notes on Trypanosomes of the Dimorphon Group, by L. E. W. Bevan, M.R.C.V.S. and M. F. MacGregor-Sharpe.
Preservation of Butter.

Rhodesian Standard Types of Maize and their Points, by H. Godfrey Mundy, Agriculturist and Botanist.
Rural Education in Rhodesia, by George Duthie, M.A., F.R.S.E., Director of Education.
Plans and Specifications for Cattle Dipping Tanks.
The Relationship of Ticks and Disease, by Rupert W. Jack, F.E.S., Entomologist.

The Head Smut of Maize (Sorosporium reilianum), by H. Godfrey Mundy Agriculturist and Botanist.

Root Gall Worm in Potatoes, by Rupert W. Jack, F.E.S., Entomologist.

Black Orange Aphis, by Rupert W. Jack, F.E.S., Entomologist

Citrus Psylla, do. do. do.

Maize Stalk Borer, or Mealie Grub, by Rupert W. Jack, F.E.S., Entomologist.

Prizes and Rules of Competition for Collections of Plants of Economic Importance.

DIPPING TANKS: GRANTS IN AID.

The Government will make grants in aid for the purpose of constructing dipping tanks, to approved applicants.

Grants will only be made after the tank has been inspected and approved by the Director of Agriculture or an official deputed by him.

Grants will be made on the £ for £ principle, but the amount paid in any case will not exceed £50.

Applications should be made to the Director of Agriculture from whom further particulars, together with plans and specifications, can be obtained.

SERVICES OF AGRICULTURAL ENGINEER.

It is hereby notified for public information that the services of Mr. W. M. Watt, Agricultural Engineer, are available to the public for the following purposes. Assistance may be obtained by farmers:—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys for plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice. All applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The question of making a charge for services of a special or prolonged nature is under consideration, and an intimation on this subject will be made through the daily press.

PRIZES AND RULES OF COMPETITION FOR COLLECTIONS OF PLANTS OF ECONOMIC IMPORTANCE.

1. The prizes undermentioned are offered by the Department of Agriculture to pupils in schools throughout Southern Rhodesia for the best collection of dried specimens of plants of economic importance growing within the Territory.

2. Several scholars may join together for the purposes of the collection. Competitors need not personally have collected all the specimens or the facts concerning them.

3. With each specimen the following particulars should be supplied, as far as possible: (a) native name and English name, if any; (b) habitat or kind of place where found growing, *e.g.*, if marshy, dry ground, etc.; (c) date of flowering; (d) approximate altitude of locality; (e) geological formation and locality, kind of rock and soil; (f) colour of flowers; (g) height or usual size of plants; (h) use or property, such a grazing, hay, food, grain, gum, timber, oil, fibre, stain, weed, fencing, and so on. It should be clearly stated what part of the plant has the use or property ascribed.

4. Quality combined with quantity should be aimed at, and each collection need not exceed fifty specimens, and each specimen is not to exceed as much as will lie upon one sheet of 10 x 16 inches (any larger are to be folded to the

size, or cut and arranged upon two sheets). Specimens need not be mounted but may lie loose upon sheets of old newspaper. Specimens should be complete and should comprise stem, leaves, flowers, and fruit. Specimen trees must include a piece of wood with the bark, which should not be less than 6 x 8 x 2 inches.

5. Crops ordinarily grown by Europeans must not be included in the collection.

6. Prizes will be awarded for—

Section 1.—A general collection as indicated in paragraph 3 (h).

Section 2.—A special collection of botanical specimens of indigenous forest trees, tall growing shrubs and creepers.

Section 3.—A special collection of specimens of the indigenous food plants cultivated or used by natives.

7. The prizes will be—

		1st	2nd	3rd
Section 1.	...	£5	£3	£2
Section 2.	...	£3	£2	£1
Section 3.	...	£3	£2	—

8. In judging the competition, the right is reserved to withhold any of the prizes in cases where the degree of merit appears insufficient, but should the collections warrant it, further prizes may be awarded.

9. Regard will be had: (a) to the selection of the plants; (b) to the completeness of the specimens showing flower and fruit, leaves, stem and roots; (c) to the completeness of the history of the specimens; (d) and to the manner of drying, complete and under proper pressure, due regard being given to the character of the specimen. Specimens are the better dried the more frequently they are changed into fresh dry paper (newspaper suffices).

10. Competing specimens may be sent in any time up til 30th April, 1911.

11. The collections are to be sent to the Agriculturist and Botanist, Department of Agriculture, Salisbury, and will remain the property of the Department.

SEED MAIZE.

The Department is able to offer for sale a limited amount of specially selected, hand picked, seed maize of the below mentioned kinds, at a price of 15s. per 100 lbs. f.o.r. 19½ mile-peg, Lomagundi railway :—

Local Hickory King,
Natal Hickory King,
Salisbury White,
Yellow Hogan.

This seed has been grown on the Government Experiment Farm, Gwibi, and has been most carefully selected, but owing to the fact that this is the first year the selection has been under the control of the Department, it is impossible to guarantee that the type is fixed or will in all cases breed entirely true.

Supplies are limited, and applications should be made as early as possible. Orders may be addressed to the Government Agriculturist, Department of Agriculture, Salisbury, and must in all cases be accompanied by cheque or post office order for the requisite amount. No orders can be reserved until payment has been received, and to avoid delay in despatch, full address and particulars with regard to forwarding should be given.

CO-OPERATIVE EXPERIMENTS.

In continuation of the system of co-operative experiments, the below mentioned seed will be available from September onwards, for free distribution in small quantities to any *bona-fide* farmer resident in Southern Rhodesia. Seed is supplied f.o.r. Salisbury—experimenters undertaking to forward a faithful report on the result of the experiments at the close of the season, on farms supplied for that purpose. Supplies of seed are limited, and not more than five different kinds can be sent to each applicant.

All applications to be addressed to the Agriculturist and Botanist, Department of Agriculture, Salisbury.

Maize.—Ladysmith white.

Leguminous Crops.—Lucerne, Egyptian clover, crimson clover, velvet beans, cowpeas, vetches, and lupines.

Summer Cereals.—Victorian wheat, Bobs' rust-proof wheat, rye, Egyptian rice, Boer manna, and Japanese millet.

Winter Pasture Plants and Grasses. — Sheeps burnet, cocksfoot, tall fescue, cowgrass clover, paspalum, and phalaris bulbosa slips.

Oil Seeds.—Virginia pea nuts, castor oil, and linseed.

Editorial Notices.

The "Journal" is issued bi-monthly, and the subscription is 5s. per annum, payable in advance. All communications relating thereto should be addressed to the Director of Agriculture, Agricultural Department, Salisbury, and if an answer is required in the pages of the "Journal," should reach this office not later than the 15th of the month preceding publication. Subscribers are requested to notify immediately the non-delivery of the "Journal."

TO ADVERTISERS.—Application for space in the "Rhodesian Agricultural Journal," should be addressed to the Director of Agriculture, Salisbury. The rates are as follows, per issue :—

Position.	Whole Page. £ s. d.	Half Page. £ s. d.	Quarter Page. £ s. d.
Inner Pages	2 0 0	1 5 0	0 15 0
Outer Cover (back) ...	4 0 0	—	—
Inner Covers (back and front) and page facing Contents	3 0 0	1 15 0	1 0 0

A discount of 10 per cent. will be allowed for standing or consecutive advertisements running through six issues. Remittances, and electros where desired, should accompany orders The right is reserved to discontinue the insertion of standing or consecutive advertisements should payment beyond the second issue be delayed.

The right of approval of all advertisements by the Director of Agriculture is reserved and his decision as to the acceptance or rejection is final.

An additional charge may be made for advertisements printed in special type, equal to any additional charges made by the printers for setting up same

Advertisements will be accepted from bona fide farmers wishing to effect sale, purchase or exchange of produce, live stock, or farm implements, at a minimum charge of 2s. 6d. per insertion of 20 words. Extra words will be charged for at the rate of 1s. for every 10 words.

Government Notices.

No. 295 of 1908.] [1st October, 1908.

IMPORTATION OF STOCK.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 8, of the 19th day of January, 1905, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries enumerated is prohibited, owing to the existence or supposed existence of destructive diseases affecting the said animals in the said countries:—

(1) All animals from the Island of Mauritius.

(2) All animals from German South-West Africa and all animals except donkeys from German East Africa.

(3) Pigs from the colonies of the Cape of Good Hope, Transvaal and the Orange River Colony, the Bechuanaland Protectorate, the Tati Concession, and other countries in which swine fever exists, subject, however, to the exceptions contained in the proviso to this section.

(4) Dogs from the territories of North-Eastern and North-Western Rhodesia and Portuguese East Africa; provided, however, that dogs from countries from which importation is permitted may be introduced through the port of Beira and brought direct into this Territory.

(5) Sheep and goats from (a) the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingswilliamstown, Komgha, Peddie, Somerset East, Stockenstroom, Uitenhage, and Victoria East, in the Cape Colony; (b) the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterburg, and Zoutpansberg, in the Transvaal; (c) Swaziland; (d) Portuguese Territory; (e) places north of the Zambesi River.

Provided, however, that the Controller of Stock may at his discretion permit the importation of pigs under six months of age for breeding purposes from the places mentioned in sub-section (3), and sheep and goats from the places mentioned in sub-section (5) hereof, on production of a certificate of a duly authorised Government veterinary officer that such animals are free from disease, have not been in contact with diseased animals, and have not come from an area where destructive disease has existed for twelve months previously.

2. The importation of organic manures, except guano, is strictly prohibited, and the importation of bone meal and bones required for fertilising or feeding purposes will only be permitted when accompanied by the certificate of a responsible and competent person that they have been thoroughly disinfected by treatment by superheated steam or other approved method. Any such manures, bone meal or bones introduced into Southern Rhodesia contrary to this regulation shall be liable to immediate destruction.

3. The areas set out in Schedule "A," and such further areas as may be added to the said schedule, shall be used in connection with pasture lands of the places to which they relate for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever.

4. The appointment of the areas set out in Schedule "B" hereto for the depasturing and quarantining of animals for slaughter in connection

with the places therein mentioned is confirmed.

5. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel and the period for which the permit shall be in force. In cases where it may appear necessary or desirable, the person to whom any such permit is issued may be required to cause the animals referred to therein to be dipped before being moved.

6. The introduction of sheep and goats against which no prohibition exists may be permitted by rail, subject to the following provisions:—

(1) Plumtree shall be regarded as the port of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto; provided, however, the Controller of Stock may allow the introduction of well-bred sheep or goats intended for sale or stud purposes without being previously dipped.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival; provided, however, that animals intended for immediate slaughter shall be exempt from dipping if marked with a distinctive brand on the back.

7. The introduction of sheep and goats against which no prohibition exists may be permitted by road, subject to the following provisions:—

(1) M'Lala Drift and Fort Tuli shall be regarded as ports of entry.

(2) All animals shall be accompanied by a certificate in the form set out in Schedule "C" hereto.

(3) All animals shall be thoroughly dipped at their owners' expense within sixteen days after their arrival.

8. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Officer at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detrained at any intermediate station without the written authority of a Government Veterinary Surgeon.

9. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the police camp nearest to the place where such entry is made, and the officer in charge of such police camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

10. All horses, mules and donkeys upon entering Southern Rhodesia shall be tested with mallein, and the owner or person in charge of such animals shall, in all respects, carry out the lawful directions of the Inspector while such animals are being tested; provided that this regulation shall not apply to animals in transit by railway through Southern Rhodesia and which are not detrained en route.

11. The Inspector may direct the detention of any animal, and its isolation for the purposes of such examinations and tests as may be deemed expedient during which period of isolation or detention it shall be maintained and tended at the expense of the owner. If in the case of any such animal a second injection of mallein, applied at an interval of not less than ten days, is followed by a reaction indicative of the existence of glanders, such animal shall be forthwith destroyed.

12. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border to and from Portuguese East Africa, may be allowed so to cross on such terms as to registration, branding, testing and other conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

13. All horses, mules and donkeys depastured on the town lands of

Melsetter and Umtali or on any public outspan adjoining such lands, and within the following area known as the Penhalonga, Imbesa and Samba Valleys, as bounded by the Umtali Waterfall Range on the north, the divide following beacons 18, 24 and 27 on the east, the Christmas Pass Range on the south, and the Palmyran Range on the west, in the district of Umtali, shall be dipped every fourteen days, by or at the expense of the owner or person in charge of such animals, unless the local Veterinary Officer shall see fit to dispense with such dipping.

14. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings, fodder, excreta or other matter or thing which may be reasonably calculated to convey such infection.

15. Any person contravening the provisions of these regulations, or the instructions or directions given in terms of these regulations, shall be liable in respect of each offence to a penalty not exceeding twenty pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

SCHEDULE "A."

Areas on or near pasture land used in connection with townships set apart for the quarantining of animals suffering from any destructive disease other than glanders, epizootic lymphangitis or African Coast Fever:—

1. For the township of Salisbury and its neighbourhood, the Government Farm Makabusi, as defined in Government Notice No. 13 of 1898, namely, about six miles from Salisbury on the Old Charter Road, and bounded on the north, north-east and west by the farm "Willowdale," and on the south and south-east by the Makabusi River.

2. For the township of Umtali, a triangular piece of land situate to the north-east of the township, being that portion of the farm "Birkley" which falls in British territory.

3. For the township of Melsetter, a piece of land included within those lines bounding the pasture lands laid out around the township, which are in common with the outspan in the west, Sawerombi on the north, and Westfield on the north-east, bounded further on the south by a line drawn from the common beacon of Westfield and Lindley to the common beacon of Fairfield and outspan.

4. For the township of Enkeldoorn, a piece of land about 2½ miles due west of the township and bounded as follows: From a point about 400 yards above the junction of a stream running south of Enkeldoorn township with streams running west from the Police Camp; thence along the first stream to the junction aforementioned; thence along a valley running due south from the said junction to a point about 700 yards distant; thence in a north-westerly direction to a point on the top of a rise about 1,200 yards distant; thence in a straight line to the first-mentioned point.

5. For the township of Victoria, a strip of land half-a-mile in width lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

6. For the township of Gwelo, a triangular piece of ground within the reserved lands around Gwelo. It is bounded south by the Watershed Block along its boundary running from its joint beacon with Kanuck westwards to another beacon 1,518 Cape roods distant, bounded north-westwards by a line about 1,350 roods in length to the Inoculation Station, and bounded north-eastwards by a line from the first mentioned beacon to the Inoculation Station, and about 1,400 roods in length. This piece of ground is called the Inoculation Camp.

7. For the township of Bulawayo that portion of the commonage bounded on the west and north by the Bulawayo-Mafeking and Gwelo railway lines, on the east by the road known as "Hillside Avenue," on the south to the limits of the commonage and Hillside, known as "Napier's Lease," approximately 4,750 acres in extent.

SCHEDULE "B."

Areas set apart for depasturing and quarantining of animals for slaughter:—

SALISBURY.—Description of the area.—A piece of land, 400 acres in extent, situated on the Makabusi River, below Maggio's plot, towards the southern boundary of the Salisbury commonage.

BULAWAYO.—Description of the area.—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi Road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres, more or less.

GWELO.—Description of the area.—Starting from a point where the Ingwenia Road crosses the railway, along this road past the sanitary stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the commonage beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins Main Street extension along this to the railway line, and down this to the starting point.

UMTALI.—Description of the area.—Starting from a point at the south-east corner of the farm "Devonshire" and south-west of "Waterfall," up the stream to where it is joined by the stream commonly known as Rifle-butt Spruit, and up this spruit to a point 300 feet below Paulington Bridge. Thence almost due north on the west of Penhalonga Road to the sanitary pits and from the sanitary pits to the Cemetery, thence due west to the "Devonshire" line and along this line south to south-west corner beacon of "Waterfall."

SELUKWE.—Description of the area.—A piece of fenced land, in extent about 300 acres, situated on the farm "Sebanga" and adjacent to the township of Selukwe.

PENHALONGA.—Description of the area.—A piece of land bounded as follows:—To the northward by a line starting from the south-east beacon of the hotel stand to the south-west and south-east beacons of Crawford's butchery. To the eastward from the south-east beacon of Crawford's butchery to the northern boundary of the Penhalonga Proprietary Mines' ground. To the southward along the northern boundary line of the Pennaionga Proprietary Mines' ground. To the westward from the north-west beacon of the Penhalonga Proprietary Mines' ground to the south-east beacon of the hotel stand.

VICTORIA.—Description of the area.—A strip of land, half-a-mile in width, lying immediately to the west of the gunpowder magazine, and extending from the Macheke River to the Chekoto range of hills.

SCHEDULE "C."

I, ...
residing at
in the district of in the
.....Colony, do solemnly and sincerely declare that the animals enumerated below are free from any contagious disease, including scab, and have not been in contact with any infected animals within six months from date hereof, and that to the best of my knowledge and belief such animals in travelling to* Station

will not come in contact with any animals amongst which scab or any other contagious disease has existed during that period; further, that such animals were thoroughly disinfected by dipping on..... and will enter Southern Rhodesia within ten days of having been dipped.

And I make this solemn declaration conscientiously believing the same to be true.

Declared to at on this day of before me.

.....

Resident Magistrate, Government Veterinary Surgeon, Scab Inspector, or Police Officer of district from which animals are being sent.

Number and general description of animals being sent

.....

Owner's name and Address

.....

Place in Southern Rhodesia to which animals are being sent

.....

* Station within Colony of origin.

CERTIFICATE ISSUED UNDER PROVISIONS OF SECTION 1, GOVERNMENT NOTICE No. 295 OF 1908.

This is to certify that the animals enumerated below are, in my opinion, free from any destructive disease, including scab, and to the best of my knowledge and belief have not been in contact with any infected animals nor come from,or through, a locality where any such disease is known to exist or has existed for twelve months from date hereof.

Date.....

Place.....

Signature of Government Veterinary Surgeon.

Number and general description of animals.....Pigs, ...Sheep, ...Goats.

Place from which animals are to be sent.....

.....

Owner's Name and Address

.....

Place in Southern Rhodesia to which it is desired to send the animals

.....

No. 110 of 1908.] [16th April, 1908.

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions:—

(1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.

(2) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."

(3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.

(4) All importations shall be by rail, and for the purposes thereof Bulawayo shall be regarded as the port of entry.

(5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcases thereof disposed of in such manner as a Government veterinary surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.

(6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions:—

(1) Importation shall be through and direct from the Coast Ports of the Cape Colonies, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.

(2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.

4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcases, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

ANNEXURE "A."

APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
2. Number and Class of cattle to be imported.....
3. Area or Farm and District where Cattle are at present located.....
.....
4. Area or Farm and District to which Cattle are to be moved.....
.....

Applicant's Signature.....

Date
Application
Permit No.

ANNEXURE "B."

I,.....

residing on the farm

in.....do solemnly and sincerely declare that the..... (number in writing) animals also enumerated below have been in my possession since birth, and that lung-sickness, pleuro-pneumonia or other contagious or infectious disease has not existed amongst any of my cattle, nor on my farm, nor among any cattle with which these animals have been in contact within the last four years, and that these animals have never been exposed for sale in any public market or stock fair, nor been in contact with strange cattle, and that to the best of my knowledge and belief such cattle in travelling to Station (*i.e.*, station where cattle are to be trucked) will not come into contact with any animals amongst which lung-sickness or any other contagious or infectious disease has existed during that period.

Number of Animals.....Bulls.....Heifers.....
Breed.....

Seller's Name and Address.....
.....

Purchaser's Name

Place in Southern Rhodesia to which animals are being sent
.....

And I make this solemn declaration conscientiously believing the same to be true.

.....

Declared to at..... on this.....
day of.....before me,
.....

Resident Magistrate for the district of
.....

No. 60 of 1909.] 1st April 1909

IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal Government Notice No. 124 of 1908, and do hereby declare and make known that, notwithstanding anything to the contrary elsewhere provided, the importation of cattle for bona fide slaughter purposes may be permitted into the Umtali district from the adjoining Portuguese territory, under the following terms and conditions:—

(1) The importation and disposal of cattle, introduced in terms of these regulations, shall be under the absolute control and direc-

tion of the local Veterinary Surgeon or other duly appointed officer, and shall be regulated by the requirements of consumption.

(2) The importation shall be by rail only, and all cattle shall be detrucked at the slaughter enclosure and immediately confined therein.

(3) All cattle admitted to the slaughter area shall be immediately branded with the letters "V.D."

(4) All cattle admitted to the slaughter area shall be slaughtered within ten days of their admission, and under no pretext whatever shall cattle so admitted be permitted to leave the said area alive; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area or in possession of any person, may be destroyed under an order of the Chief Inspectoir or Controller of Stock.

(5) No meat shall be removed from the said area without special permission unless it is entirely free from skin and ears.

(6) The hides of animals slaughtered in the said enclosure shall be immediately immersed in an approved insecticide for a period of not less than twelve hours, and shall not be removed from the said enclosure unless accompanied by a certificate signed by a Veterinary Surgeon that they have been satisfactorily disinfected and dried.

(7) Any person contravening the provisions of these regulations or the instructions or directions of the local Veterinary Surgeon or other duly authorised official, given in terms of these regulations, shall be liable, in respect of each offence, to a penalty not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months, unless where more severe or heavier penalties have, by the aforesaid Ordinance, been expressly provided.

No. 268 of 1907] [26th December, 1907

REMOVAL OF CATTLE FOR SALE.

NOTWITHSTANDING anything to the contrary contained in the Regulations published under Government Notices Nos. 188 of 1906 and 217 of 1907, I, under and by virtue of the powers conferred upon me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide as follows:—

1. The assembly of cattle for purposes of sale by auction or otherwise may be permitted as such places and under such conditions as the Chief Inspector may from time to time prescribe.

2. The movement of cattle into the province of Mashonaland and the fiscal division of Gwelo from other places in Southern Rhodesia may be permitted under such conditions as the Chief Inspector may from time to time prescribe.

3. The granting of permits for the purposes of Sections 1 and 2 hereof and the nature of the conditions to be attached thereto shall be at the absolute discretion of the Chief Inspector.

4. Any person contravening the provisions of these Regulations or the conditions attached to permits issued thereunder shall be liable to a fine not exceeding £20, or, in dafault of payment, to imprisonment with or without hard labour for a period not exceeding three months.

No. 216 of 1909] [23rd September, 1909

MOVEMENT OF CATTLE, PROVINCE OF MASHONALAND AND DIVISION OF GWELO.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices No. 217 of 1907, Nos. 114 and 170 of 1908 and No. 199 of 1909, and so much of any other Regulation as may be repugnant to or inconsistent with the provisions of these Regulations, and declare that the following shall be of full force and effect in lieu, from date of publication, within the Province of Mashonaland and the Fiscal Division of Gwelo, as defined by the "Southern Rhodesia Boundary Regulations Amendment Regulations, 1898," which areas are hereby declared to be infected with a destructive disease: -

1. The movement of cattle within the said areas is prohibited save and except—

(*a*) on permission granted by an inspector or sub-inspector or other officer authorised by the Administrator;

(*b*) within the boundaries of any single farm where such cattle are depastured;

(*c*) within any area enclosed by a substantial fence;

(*d*) within the boundaries of the various commonages, town lands or grazing ground common to any mining camp;

(*e*) for cattle the property of natives within a radius of four miles of their owners' kraal situate within the boundaries of any native location or reserve; the site of such kraal shall be deemed to be the place where it is situated at the date of publication hereof, and as is hereinafter further provided.

2. The movement of cattle for *bona fide* farming, breeding, mining, dairying, grazing and slaughter purposes may be permitted under the written authority of an official thereto duly authorised, subject to the following terms and conditions -

(*a*) the written permission of owners, occupiers or managers of all occupied lands, and, in the case of native reserves, of the Native Commissioner of the district over which cattle shall pass, is obtained; provided that, in the event of such owners, occupiers, managers or Native Commisssoners refusing to grant such permission, the Controller of Stock may direct the issue of a permit of removal if satisfied that the necessary permission is withheld without good and sufficient cause; and provided further that such permission shall not be required in respect of any movement of cattle within native districts or group of native districts as defined under Section 3 hereof, or in such districts or group of districts as may hereafter be defined, or in respect of movements authorised in terms of subsection (*c*) of the said Section;

(*b*) that such cattle shall, before being moved, be thoroughly dipped or sprayed to the satisfaction of the officer issuing the permit, and, if intended for slaughter, shall where possible be branded, under the supervision of the officer issuing the permit, with the letters "V.D." on the near hind quarter;

(*c*) that cattle intended for slaughter shall, on arrival at destination subject to the terms of clause (*d*) hereof, be immediately taken to the prescribed quarantine area and there be quarantined and confined, and, where not branded in terms of clause (*b*) hereof, be similarly branded under the supervision of a duly authorised officer

(*d*) that all cattle intended for slaughter brought to their destination and not dipped or sprayed in terms of clause (*b*) hereof, shall be immediately thoroughly dipped or sprayed

(*e*) that all cattle admitted to the quarantine area shall be slaughtered within twenty-one days of admission, and only be permitted to leave the area for the purpose of being driven to the abattoir for slaughter.

and all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found outside the said area, at large or in possession of any person may be destroyed under an order of the Chief Inspector or Controller of Stock;

(*f*) that intermediate depots, or concentration camps, for slaughter stock may be allowed at centres approved of by the Chief Inspector of Cattle, provided that no such camp shall be situated within a less radius than five miles of any commonage, town lands, or grazing ground common to any mining camp, railway station or siding.

3. The movement of working cattle may be permitted under the written authority of an official thereto duly authorised—

(*a*) within the borders of the following native districts:—Gwelo, Hartley Lomagundi, Marandellas, Melsetter, Selukwe and Umtali;

(*b*) within the following groups of native districts:—
(1) Charter and Chilimanzi;
(2) Mtoko, Mrewa, Makoni and Inyanga;
(3) Goromonzi' Mazoe and Darwin;
(4) Chilimanzi, Victoria, Ndanga and Chibi;

(*c*) between the Makondo Copper Mine in the Ndanga district and Karombe's Kraal in the Umtali district along the west bank of the Sabi river;

Provided that all cattle working under this section should be thoroughly dipped or sprayed every fourteen days, and provided that movements will be permitted for such periods as the Controller of Stock may in his discretion and on the advice of the Chief Inspector deem expedient, and that such permission may at any time be withdrawn or withheld without notice.

4. All applications for the removal of cattle from one native district to another shall be submitted for the approval of the Cattle Inspectors of the districts to and through which movements are made. All permits granted under the provisions of these regulations shall specify the number and brands of cattle, route to be traversed and time to be allowed for each journey, and such other conditions as it may be deemed expedient to prescribe; and all such permits shall be in the possession of the person travelling with or in charge of the cattle. Any breach of such conditions shall be deemed a contravention of the regulations in terms of section 9 hereof.

5. All veld-fed animals within the limits of the various commonages or town lands, or other centres where there is a common grazing ground and upon which public dipping tanks have been established, shall be dipped therein at least once every fourteen days; provided that the Controller of Stock may, on the advice of the Chief Inspector, direct the temporary suspension of this regulation for such reasons as he may regard as sufficient.

6. The following charges shall be paid at the time of dipping by the owner of the cattle or other animals required to be dipped under these regulations in respect of any dipping done at the public dipping tank:—

For horned cattle, 6 months and over	3d. per head.
For horses and mules	3d. „
For calves (under 6 month) and donkeys ...	2d. „
For small stock	½d. „

with a minimum charge of 6d. on any number of animals not aggregating such fee under the above tariff.

7. Any permit granted may be summarily suspended by any Inspector or Sub-Inspector or member of a police force finding cattle travelling under the same to be infested with ticks, and such officer may detain such cattle until such time as the animals have been cleansed to his satisfaction.

Any dipping or spraying required to be done under these regulations shall be carried out with an approved tick-destroying agent by the owner of the animals; provided that the Inspector or Sub-Inspector may at his discretion carry out such treatment at the entire cost of the owner of such animals.

The Controller of Stock may, on the advice of the Chief Inspector, direct the temporary suspension of dipping and spraying for such reasons as he may regard as sufficient.

8. Whenever the owner, occupier or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying or dipping or any other method permitted by these or any other regulations, the Cattle inspector may order such natives or others as have cattle on the same farm to cleanse such cattle or any others before permitting them to enter or pass over such area, and the Native Commissioner of the district in which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle, at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

9. Any person contravening any of the provisions of these regulations shall, upon conviction, be liable, in respect of each offence, to the fines and punishment prescribed by the Ordinance; and, in the case where no special punishment is provided, to a fine not exceeding £20 or, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding three months unless the penalty is sooner paid.

No. 356 of 1908] [19th November, 1908

MOVEMENT OF CATTLE INTO MATABELELAND.

NOTWITHSTANDING anything to the contrary contained in the Regulations published under Government Notices Nos. 188 of 1906 and 217 of 1907, I, under and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide as follows:—

1. The movement of cattle from the Province of Mashonaland into the Province of Matabeleland and from the Fiscal Division of Gwelo into other parts of Matabeleland may be permitted under such conditions as the Chief Inspector may from time to time prescribe, provided, however, that such movement shall not be permitted in respect of cattle imported from the country to the North of the Zambesi River until they shall have first remained for a period of at least twelve months in the Province of Mashonaland or the Fiscal Division of Gwelo.

2. The granting of permits for the purposes hereof, and the nature of the conditions to be attached thereto, shall be at the absolute discretion of the Chief Inspector.

3. Any person contravening the provisions of these regulations, or the conditions attached to permits issued thereunder, shall be liable to a fine not exceeding £20, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding three months.

No. 39 of 1909] [11th March, 1909

MOVEMENT OF CATTLE, PROVINCE OF MATABELELAND.

I. UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 188 of 1906 and 216 of 1907, and declare the following to be of full force and effect in lieu thereof within the province of Matabeleland, exclusive of the district of Gwelo, as described and defined by section 4 (c) of the Southern Rhodesian Boundary Regulations Amendment Regulations, 1898, which is hereby declared to be an area infected with a destructive disease, and is hereinafter called the said area.

2. The movement of all cattle within the said area is prohibited save and except

(a) on permission granted by the local Cattle Inspector;

(b) within the boundaries of any single farm where such cattle are depastured;

(c) within an area of land enclosed by a substantial fence;

(d) within a radius of four miles from any native kraal situate within the boundaries of any native location or reserve, and as hereinafter further provided.

3. The movement of cattle for slaughter, grazing, bona fide farming, mining or breeding purposes, or for private milk supplies, shall be permitted under the written authority of an official thereto duly authorised, subject to the following terms and conditions:—

(a) that the written permission of owners, occupiers, or managers of all occupied land, and in the case of native reserves, of the Native Commissioner of the district over which such cattle shall pass, is first obtained; provided that in the event of such owners, occupiers, managers or Native Commissioners refusing to grant permission, the Controller of Stock may direct the issue of a permit of removal, if satisfied that the necessary permission is withheld without good and sufficient cause;

(b) that such cattle shall, before being moved, be thoroughly disinfected by dipping or spraying, to the satisfaction of the officer issuing the permit, and at the expense of the owner of such stock, and, if intended for slaughter, shall where possible be branded, under the supervision of the officer issuing the permit, with the letters "V.D." on the near side of the neck;

(c) that cattle intended for slaughter, shall, on arrival at destination, subject to the terms of clause (d) hereof, be immediately taken to the prescribed quarantine area and there be quarantined and confined, and, where not branded in terms of clause (b) hereof, be similarly branded under the supervision of a duly authorised officer;

(d) that all cattle intended for slaughter brought to their destination and not disinfected by dipping or spraying, in terms of clause (b) hereof, shall be immediately taken to the public dipping station and there be thoroughly dipped or sprayed before being taken to the quarantine area;

(e) that all cattle admitted to the quarantine area shall be slaughtered within twenty-one days of the admission, and only be permitted to leave the area for the purpose of being driven to the abattoir for slaughter; all such cattle shall, after admission to the said area, be considered as likely to be infected with disease, and if found wandering outside the said area, or in possession of any person, may be destroyed under an order of the Chief Inspector or Controller of Stock.

4. The movement of working cattle may be permitted under the following conditions only:—

Within the said area from private farms, mines and trading stations to any centre of consumption, or to or from a railway station or siding, or to and from any other farm under the permit of a duly authorised officer, which permit shall fully set forth the route to be traversed; provided that no permit shall be issued until the person applying for the same shall produce the written consent of owners, occupiers or managers of occupied lands proposed to be traversed, and in the case of native reserves, of the Native Commissioners, and that such cattle, before being moved, be thoroughly disinfected by dipping or spraying at the expense of the owner, and to the satisfaction of the officer issuing the permit; provided, further, that in the event of such consent being unreasonably withheld, the Controller of Stock may direct the issue of a permit.

5. All applications for the removal of cattle from one native district to another shall be submitted for the approval of the Government Vete-

rinary Surgeon at Bulawayo and the Cattle Inspector of the district to which the removal is to be made.

6. All permits granted under the provisions of this notice shall specify the number and brands of cattle, route to be traversed, and time allowed for each journey. Any breach of these or other conditions endorsed on the permit by the issuing officer shall be deemed a contravention of these Regulations, in terms of section 9 hereof.

All veld-fed animals within the limits of the various commonages or townlands, or other centres where there is a common grazing ground and upon which public dipping tanks have been established, shall be dipped therein at least once every fourteen days; provided that the Controller of Stock may, on the advice of the Veterinary Department, direct the temporary suspension of this Regulation, for such reasons as he may regard as sufficient.

8. The following charges shall be paid at the time of dipping by the owner of the cattle or other animals required to be dipped under these Regulations, in respect of any dipping done at a public dipping tank:—

For Cattle (over six months)	3d.	per head.
,, Horses and Mules	3d.	,,
,, Calves (six months and under)	2d.	,,
,, Small Stock	½d	,,

with a minimum charge of 6d. for any number of animals not aggregating such fee under tariff.

9. Any disinfecting by spraying required to be done under these Regulations shall be carried out with an approved insecticide by the owner of the animals so sprayed; provided that the Inspector may, at his discretion, carry out such disinfection, with the assistance of and at the entire cost of the owners of the animals sprayed, the cost of such disinfection being payable at the time of the spraying.

10. Any person contravening any of the provisions of these Regulations shall, upon conviction, be liable, in respect of each offence, to the fines and punishments prescribed by the Ordinance; and, in the cases where no special punishment is provided, to a fine not exceeding £20; or, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding three months, unless the penalty be sooner paid.

No. 45 of 1909] [13th March, 1909

RABIES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the Regulations promulgated by Government Notices Nos. 42, 156 and 228, of 1907, except as to acts done or penalties incurred at the date of the coming into force of this Notice, and except as to officers appointed under Government Notice No. 286 of 1906, whose appointments shall remain valid for the purposes of this Notice, and declare the following Regulations shall have full force and effect in lieu thereof:—

1. All and several the various native districts of Southern Rhodesia are hereby declared to be areas infected with the disease of rabies.

2. Subject to any penalty a dog owner may have incurred under Government Notice No. 285 of 1906 by not registering his dog before the first day of February, 1907, the owner of any unregistered dog liable to registration may register the same at any time after the said date.

3. On and after the date of this Notice becoming operative the owner of every dog arriving at the age of three months, and the owner of every dog imported into Southern Rhodesia after that date, shall register such dog with an official appointed for that purpose, provided that this provision shall not apply to any municipality, township or similar area in which provision for registration exists and is duly enforced.

4. A registration badge shall be issued for each and every dog registered, and the said badge shall be attached to a proper and sufficient collar to be supplied by the owner, which must be placed and kept on each dog registered.

5. A fee to cover the cost of registration and supply of badge in the amount of sixpence will become demandable and payable on registration of each dog.

6. Any dog found at large after the date of this Notice becoming operative, not having and bearing a registration badge duly issued by an official or the local authority, may be summarily destroyed by any person.

7. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may, on it appearing to him that any dog or other animal is showing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

8. Should any dog show symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these Regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

9. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

10. The carcases of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

11. In the event of any outbreak of rabies occurring, all owners of dogs within fifteen miles of such outbreak, or such other area as may be fixed, shall, on notification by any of the above-mentioned officials, or by Government Notice in the "Gazette," at once place and keep their dogs in a safe enclosure, or chained up, for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash held by the person exercising them.

12. Any dog found at large in a notified area at any time during the prescribed period may be summarily destroyed by any person, and the owner or person responsible for the custody of such dog shall be liable to the penalty hereinafter laid down.

13. Any person contravening any of the above Regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding one month.

No. 249 of 1908] [27th August, 1908

PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than bona-fide farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act 1859, and upon conviction to a fine not

exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

SUMMARY OF "THE GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows:—

(a) Birds and Small Buck.
(b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tasessibe, Waterbuck and Wildebeest.
(c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—

In Mashonaland:

Birds from 1st May to 30th September.
Small Buck from 1st May to 31st October.

In Matabeleland:

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of bona-fides, should be addressed to the Secretary for Agriculture.

Game for Farming Purposes.—Permits are granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Secretary for Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage in such land.

Elephants on occupied farms Melsetter.—The destruction of Elephants when found on occupied farms on the High Velt in Melsetter District is authorised (vide Government Notice No. 284 of 1908).

Tsetse Fly, Hartley District.—Government Notice No. 160 of 1910, withdraws the Close Season for Class "B" in a certain area in the Hartley District until 30th June, 1911, and transfers from Class "C" to Class "B" Eland, Koodoo, and Zebra so far as that area is concerned. Under Government Notice No. 129 of 1909 game in Class "B" may be shot without a licence in this area.

Game in Class "A" may be hunted in the close season until further notice, on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Butawayo and within a radius of two

miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, vide Government Notice No. 121 of 1907.

Export of Game.—No living Game or the Eggs of any Game birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

No. 160 of 1910] [30th June, 1910

GAME LAW CONSOLIDATION ORDINANCE, 1906.

UNDER and by virtue of the powers conferred upon me by the "Game Law Consolidation Ordinance, 1906," I do hereby extend the provisions of Government Notice No. 40 of 1909, as amended by Government Notices Nos. 128 and 129 of 1909, for a furthrr period of one year till the 30th June, 1911.

No. 108 of 1910] [19th May, 1910.

PROTECTION OF GAME ON COMMONAGES.

UNDER and by virtue of the powers conferred upon me by the "Game Law Consolidation Ordinance, 1906," I do hereby declare that up to the 30th day of April, 1911, all game within the limits of the Commonage or Townlands of Bulawayo, and within a radius of two miles of the Magistrate's Court, Gwelo, shall be strictly protected, and shall not be hunted or destroyed.

No. 391 of 1908] [17th December, 1908

BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by "The Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdrew the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909:—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

(2) (a) The form of application for registration of a brand shall be that marked "A" in the schedule attached to this Notice.

(b) The form of a certificate of registration shall be that marked "B" in the said schedule.

(c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said schedule.

(d) The form of a certificate of such transfer shall be that marked "D" in the said schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the

first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

9. There shall be payable to the Registrar or Deputy Registrar:—

(a) For every separate registration of a brand, 5s.

(b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next in order, according to the following table:—

i. Off Neck or Rump (or Thigh);
ii. Near Shoulder (or Top of Arm);
iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

i. Off Rump (or Thigh);
ii. Near Shoulder (or Top of Arm);
iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

i. On Near Side or Ribs;
ii. Near Rump (or Thigh);
iii. Off Shoulder;
iv. Off Side or Ribs;
v. Off Rump (or Thigh).

(d) In the case of ostriches:—

i. On Near Thigh;
ii. On Off Thigh.

11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the "Gazette."

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to show cause why the same should not be cancelled; if cause is not shown to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the "Gazette" a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to show that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the provisions of this section shall on conviction be liable to a fine not exceeding £5.

No. 52 of 1909] [25th March, 1909

CONDITIONS UNDER WHICH GOVERNMENT VETERINARY SURGEON'S SERVICES ARE AVAILABLE TO THE PUBLIC.

1. ON and after 1st April, 1909, the services of Government Veterinary Surgeons will be available to the public, free of charge for the following purposes only:—

(1) Attending and giving professional advice in connection with the following diseases, viz.:—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Footrot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lung-sickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

(2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

(3) Inoculations against the following diseases:—

Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz.:—

	£	s.	d.
(1) For every professional visit within three miles of his office or residence	0	5	0
(2) For every professional visit beyond such distance plus an additional charge of 2s. 6d per hour whilst engaged in such visits, or £2 2s. a day of 24 hours;	0	10	6
(3) For advice given at the Veterinary Surgeon's office, for each animal, per visit	0	2	6
(4) The following to be charged in addition to visiting fees:—			
a. For every examination as to soundness, each	1	1	0
b. For castration, horses, each	1	1	0
c. ,, bulls ,, ...	0	5	0
d. ,, donkeys ,, ...	0	10	6
e. For parturition cases, mares, each	2	2	0
f. For parturition cases, cows, each	1	1	0
g. For other operations, according to nature, from 5s. to £2 2s.			

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government veterinary surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government veterinary surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the veterinary surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government veterinary surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government veterinary surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government veterinary surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

No. 281 of 1909] [2nd December, 1909

UNDER and by virtue of the powers vested in me by section 8, sub-section (1) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the removal of the following articles from areas known or suspected to be infected with any destructive disease:

Skins, hides, green forage, hay of any sort, fodder, bedding, reeds, kraal or stable manure, or any article which may reasonably be supposed to convey infection, or infective insects.

Any person removing articles in contravention of the aforesaid prohibition shall be liable to the penalties on that behalf provided and to have such articles destroyed, in terms of section 5, sub-section (6) (a) of the aforesaid Ordinance.

No. 309 of 1909] [30th December, 1909

IMPORTATION OF PLANTS &c., REGULATIONS.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare and make known that the following regulations shall be of force and effect on and after 1st day of March, 1910:—

(1) No person shall introduce into Southern Rhodesia from outside South Africa any consignment of potatoes unless accompanied by a certificate from

the consignor stating fully in what country and district of that country the potatoes were grown, and that the disease known as Warty disease or black scab, caused by the fungus *Chrysophlyctis endobiotica* Schil, is not known to occur on the land on which the potatoes were grown. Any consignment not accompanied by such certificates will be liable to be seized and destroyed.

(2) All consignments of potatoes which are imported from other parts of South Africa or from oversea, if found on inspection to be infested with any pest or disease, other than black scab, will be sorted at the expence of the consignee and the diseased tubers destroyed.

(3) A charge of 6d. per bag or case will be made for sorting.

(4) Should any consignment on arrival be found to be infested with black scab, it will not be sorted but will be totally destroyed.

(5) Any person guilty of a contravention of these Regulations shall be liable to a fine not exceeding £10.

No. 263 of 1909] [25th November, 1909.

IMPORTATION OF SWINE.

NOTWITHSTANDING the prohibition which exists under section 1 subsection 3 of Government Notice No. 295 of 1908 against the importation of swine from the Colony of the Cape of Good Hope, I, under and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby provide that swine may be imported from the Cape of Good Hope under a permit issued by the Chief Inspector or Examiner of Stock, and subject to any examination and quarantine on entry that may be necessary, and to such other conditions as may be deemed expedient to attach to such importations.

No. 211 of 1909.] [16th September, 1909.

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—

Grass	Straw
Hay	Lucerne Hay
Forage	Green Lucerne
Sugar Cane	

or any other bedding or fodder plant.

No. 264. of 1909] [25th November, 1909

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of horns and raw hides of cattle from the Bechuanaland Protectorate.

Any horns or hides introduced in contravention of this prohibition shall be confiscated and destroyed.

No. 10 of 1910] [27th January, 1910.

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by section 8 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction of hides of every description from North-Western Rhodesia and Portuguese East Africa. I do further declare, in terms of section 5, sub-section (6) (a), that any hides introduced in contravention of this prohibition shall be confiscated and destroyed.

Any person contravening the provisions of this Notice shall, upon conviction, be subject to the penalties prescribed by the aforesaid Ordinance.

No. 128 of 1910] [9th June, 1910

IMPORTATION OF HIDES.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notice No. 10 of 1910, in respect of the prohibition of importation of hides from North-Western Rhodesia.

No. 79 of 1910] [7th April, 1910

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby direct that all cattle found within an area of twenty miles of the Crocodile River, in the native districts of Tuli and Chibi, in contravention of the provisions of Government Notice No. 47 of the 10th March, 1910, shall be forthwith destroyed.

W. H. MILTON,
Administrator.

By command of His Honour the Administrator in Council,
F. J. NEWTON,
Treasurer.

No. 119 of 1910] [2nd June, 1910

IMPORTATION OF BEESWAX, ETC.

WHEREAS legislation has been enacted and promulgated restricting the importation of bees, beeswax, foundation comb, honey, used beehives and beehive accessories into Cape Colony, Orange River Colony, Transvaal, Natal, Swaziland, Basutoland, Bechuanaland Protectorate, and the Province of Mozambique, except from such South African Colonies and States as have enacted similar restrictive legislation, it is hereby notified for general information that the restrictions imposed under Government Notice No. 228 of 1909 do not apply in regard to the importation of the above-mentioned articles from the aforesaid Colonies and States.

No. 142 of 1910] [16th June, 1910

AFRICAN COAST FEVER.

UNDER and by virture of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the movement of cattle within the native districts of Umzingwane, Matobo and Insiza, and all permits issued in respect of these districts, and now current, are hereby cancelled.

No. 147 of 1910] [23rd June, 1910

UNDER and by virtue of the powers conferred on me by the "Fencing Ordinance, 1904," I do hereby define the area as described hereunder to be a district for the purposes of the said Ordinance, and in terms of section four thereof, bring the provisioes of Part I. of the said Ordinance into operation in the aforesaid district.

DESCRIPTION OF AREA.

That portion of the native districts of Goromonzi and Mazoe bounded:—

To the Northwards by a line running alone the boundaries of the following

farms, leaving them to the south thereof: Nalire, Sigaro, Selby, Mount Hampden, Bendauch, Glenara, Eskbank, The Springs, The Grove, Umritsur, The Meadows.

To the East and South-Eastwards by a line running along the boundaries of the following farms, leaving them to the west and north-west thereof: The Meadows, Rudolphia, Thornvlei, Grazely, Guernsey, Gilnockie, Gardiner, Sabastopol, Ventersburg, Epworth, Hatfield Estate, Codavery, Iddesleigh.

To the South and South-Westwards by a line running along the boundaries of the following farms, leaving them to the north and north-east thereof:— Iddesleigh Extension, Boutelle, Eyerston, Spreckley, Waterfall, Makabusi Outspan, Willowvale, Heaney, Whitecliff, Rainham and Sunnyside.

To the Westwards by a line running along the boundaries of the following farms, leaving them to the east thereof: Sunnyside, Derry, Penrose and Nalire, but excluding the following properties: all freehold properties within the Salisbury town lands, the Ardbennie township, and the farms Avondale and Mount Pleasant.

No. 166 of 1910] [30th June, 1910

IT is hereby notified for public information that the subjoined Ordinance, entitled the "Animals Diseases Amendment Ordinance, 1910," has been assented to by His Excellency the High Commissioner, and is hereby published, in terms of the 36th section of the Southern Rhodesia Order in Council, 1898.

Ordinance No. 2, 1910] [Promulgated 1st July, 1910

AN ORDINANCE to amend the "Animals Diseasas Consolidation Ordinance, 1904."

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:

1. The definition of "animal," as contained in sub-section (1) of section 3 of the "Animals Diseases Consolidation Ordinance, 1904," shall include poultry as hereinafter defined, and the provisions of the said Ordinance shall extend and apply to such poultry

2. "Poultry means domestic fowl, ducks, turkeys, geese, pigeons, peafowl and domesticated guinea fowl.

3. This Ordinance may be cited for all purposes as the "Animals Diseases Amendment Ordinance, 1910."

No. 127 of 1910.] [2nd June, 1910.

IMPORTATION OF CATTLE FROM NORTH-EASTERN RHODERIA AND NYASALAND.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that the importation of cattle from North-Eastern Rhodesia and Nyasaland may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle be first had and obtained.
2. All cattle shall be introduced by way of the town or port of Feira, which is hereby declared a port of entry.
3. All applications for permission to import shall be accompanied by
 [1] A certificate by a Government Veterinary Surgeon of the territory of origin that
 a. the districts from which they come and through which they pass are free from contagious diseases of animals;
 b. the animals in respect of which the application is being made have been examined and are free from any destructive disease,

[2] A certificate from a Government Veterinary Surgeon of North-Eastern Rhodesia, with respect to catttle from Nyasaland, that the districts of North-Eastern Rhodesia through which they have passed are free from contagious diseases of animals.

Provided, however, that until the Government of Nyasaland obtains the services of a qualified Veterinary Surgeon the certificate of a District Commissioner as to [1] a. and the certificate of a Government Veterinary Surgeon of North-Eastern Rhodesia as to [1] b. shall be accepted.

4. All cattle shall on entry be taken to a quarantine area defined by the Chief Inspector of Cattle, and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, not less than three months.

5. Cattle at Feira at the date of promulgation of this notice may be removed to the quarantine area on permission of the Chief Inspector of Cattle without the certificates detailed above.

6. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties have been provided for such offence by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

SCHEDULE "A."

1. CERTIFICATE UNDER SECTION 3. [1], a.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers,
.....Calves,
.....Oxen and Bulls,

and that the districts from which they come and through which they will pass in this territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signature.....
Government Veterinary Surgeon
(or District Commissioner, Nyasaland).

2. CERTIFICATE UNDER SECTION 3. [1], b.

I hereby certify that I have examined the following cattle belonging to Mr.....

.....Cows and heifers,
.....Calves,
.....Oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signature.....
Government Veterinary Surgeon.

3. CERTIFICATE UNDER SECTION 3. [2].

I hereby certify that the following cattle belonging to Mr.....

..... Cows and heifers,
.....Calves,
.....Oxen and bulls,

in transit from Nyasaland to Southern Rhodesia, will not traverse any area infected with a destructive disease of cattle.

Signature.....
Government Veterinary Surgeon.

NOTE.—Cattle from North-Eastern Rhodesia require Certificates Nos. 1 and 2.
Cattle from Nyasaland require Certificates Nos. 1, 2 and 3.

No. 168 of 1910.] [30th June, 1910.

MOVEMENT OF CATTLE: MAZOE, GOROMONZI, MARANDELLAS.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw the regulations promulgated by Government Notice No. 68 of 1910, and so much of Government Notice No. 216 of 1909 as may be repugnant to or inconsistent with the subjoined regulations, and make the following provisions in lieu thereof:—

1. The movement of all cattle is hereby prohibited within the following areas:—

[1] The native district of Mazoe south of a line drawn from the northernmost beacon of Moore's grant to the north-east beacon, and thence to the south-east beacon of that estate; thence to the eastern beacon of the Howick Estate; thence to the eastern beacon and to the southern beacon of Burley Bottom, and thence to the south-western beacon of Belford Estate No. 2; thence following the western and southern boundary of Belford Estate to the westernmost beacon of Springvale; thence following the southern boundary of Springvale and Great B, and the eastern boundary of the latter farm to the southernmost beacon of Arnold's; thence in a line eastwards to the western beacon of Pote, and thence along the northern boundary of that farm to the Poorti River.

[2] The native district of Goromonzi south of a line drawn from the north-west beacon of Bonny along the western boundaries of that farm and the Vale to the south-west beacon of the latter and from that point along the northern boundary of the Msana Reserve to the Inyagui River.

[3] The commonage of Salisbury.

[4] The following area partly within each of the native districts of Goromonzi and Marandellas from the south-west beacon of Roraima along the western boundary of this farm to the south-west beacon of Essexdale, thence to its north-west beacon, thence to the north-east beacon of that farm, thence along the north-west boundary of the farm Shortlands, thence along the western boundary of Loquat Grove to its north-west beacon, thence up the Inyagui River to the north beacon of Cotter, thence to its eastern beacon, thence to the north-west beacon of March, thence along the north-eastern boundaries of the farms March, Bovey Tracey, and Mangwendi Mission, thence from the north-eastern beacon of the last-named along the north-eastern boundary of the farms Gatzi and Allen, thence along the eastern boundaries of Ta ra ra, Boom, De ay, thence along the southern boundaries of De ay, Alexandra, Waltondale, Dudley Estate, and thence along the western boundary of Dudley Estate to its north-western beacon, thence

along the southern and western boundaries of the Lendy Estate to its north-western beacon and thence to the southern boundary of Roraima to the first-named point,

save and except—

a. on permission granted by an Inspector or Sub-Inspector or other officer authorised by the Administrator;

b. with the boundaries of any single farm where such cattle are depastured;

c. for cattle, the property of natives, within a radius of four miles of their owner's kraal, situated within the boundaries of any native location or reserve; the site of such kraal shall be deemed to be the place where it is situated at the date of publication hereof.

2. The following movements of cattle may be permitted within the above-mentioned areas under the written authority of an official thereto duly authorised and subject to such conditions as it may be deemed expedient to prescribe—

a. slaughter cattle to centres of consumption;

b. cattle for mining and farming purposes, including oxen required for ploughing, cattle required for breeding or dairying and grazing, but the latter only where shortage of pasturage or water is proved to exist;

c. cattle detained *en route* under Government Notice No. 68 of 1910;

d. transport cattle solely for the purpose of wood riding to one mine or group of mines and within such limits as may be endorsed on the permit, and for the purposes of the sanitary service only within the commonage of Salisbury, exclusive of that portion defined in section 3 b.

3. No cattle shall be permitted to enter or leave the under-mentioned areas:—

a. the farms Gletwyn, Stamford, and Plot 50, Avondale, in the native district of Goromonzi;

b. that portion of the commonage of Salisbury bounded by the railway from the point where it enters the commonage on the west side of the Hillside crossing, thence along the fence on the banks of the Makabusi River and up that river to its junction with the eastern boundary of the commonage and thence following the boundary in a westerly direction to the point first named;

c. the farms Bitton and Syston, both situated in the native districts of Mazoe and Goromonzi;

d. the fenced area of Marandellas, including the farms Rockery, Progress, Longlands, Revolt, Rakodzi, Springvale, Retreat, Uplands, Glensomers, Elmswood, Rusawi Outspan, and a portion of Lottie.

4. The removal of the following articles from the areas mentioned in 3 is prohibited, save and except with the permission, in writing, of the Chief Veterinary Surgeon:—

Green forage, hay of any sort, fodder, bedding, reeds, manure, or any other article which may reasonably be supposed to convey infection.

5. Any person contravening any of the provisions of these Regulations shall, upon conviction, be liable, in respect to each offence, to the fines and punishments prescribed by the Ordinance; and in cases where no special punishment is provided, to a fine not exceeding £20, or, in default of payment, to imprisonment, with or without hard labour, for any period not exceeding three months, unless the penalty be sooner paid.

Department of Posts and Telegraphs,

Southern Rhodesia.

Postal Notice No. 24 of 1909.

AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of sixpence for the first lb., and threepence for each subsequent lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

Biscuits	Dried Meats	Plants
Bread	Eggs	Poultry
Butter	Flour	Seeds
Confectionery	Flowers	Sugar
Cigarettes	Honey	Tobacco
Dried and Bottled Fruits	Jam	Wool Samples

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

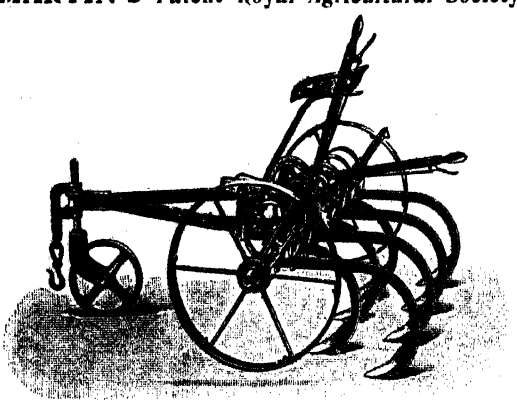
The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

This scheme must be regarded as purely experimental, and the Government reserves the right to modify these special rates of postage should too great a financial loss result.

G. H. EYRE,
Postmaster General.

General Post Office, Salisbury,
20th July, 1909.

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